

A COMPARISON OF COMPUTER-GENERATED SPEECH:  
ECHO VERSUS VOTRAX

by

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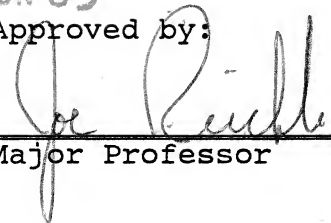
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## ABSTRACT

The current investigation examined the intelligibility of two commercially available speech synthesizers, the Echo II and Votrax Type N' Talk speech synthesizers, compared with the intelligibility of natural speech.

Thirty-two normal adults, ages 23 to 38, served as subjects. During session one, subjects listened to and repeated Echo and Votrax synthesized speech materials presented randomly within single word, low probability, and high probability sentence conditions. During session two, subjects listened to natural speech stimuli recorded by a male talker. Subject responses were transcribed on-line and tape-recorded.

Statistical analysis revealed that subjects, overall, performed significantly better with the Votrax stimuli. Subject performance was significantly better with natural speech when compared to synthesized speech. The effect of repeated exposure to specific stimuli revealed a significant change in subject performance over time with high probability stimuli but not with single words or low probability stimuli. An error analysis was performed for all initial and final phoneme responses in the single word condition.

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## Overview of Communication Aids

Augmentative communication systems consist of a set of graphic or gestural symbols used to replace or supplement the vocal/aural communication mode. It is estimated that there may be 800,000 to 1,500,000 nonvocal Americans who could benefit from using an augmentative communication system (Jones, 1981; Working with the nonspeaking person: An interview with Howard Shane, 1981). Many of these individuals will be candidates for a type of augmentative system that involves the use of an electronic communication aid.

Regardless of the physical form of the communication aid, one or a combination of three basic procedures are used to formulate a message. These include: direct selection, scanning, and encoding. Using the direct selection approach, the user points directly to the desired symbol or vocabulary element (Vanderheiden, 1975). Pointing may be accomplished using fingers, toes, headpointers, elbows, or any other body part with which the user can reliably emit a pointing response. Direct selection is perhaps the quickest, least expensive procedure. However, not all individuals with handicaps have the physical abilities necessary to use this approach. For those who are more severely motorically

involved, a scanning procedure may be preferred (Harris and Vanderheiden, 1980).

The scanning approach allows the user to access a reasonably expansive vocabulary while using relatively little motor movement. This technique requires that message elements, or groups of elements, be presented to the user one at a time. The system user then signals to indicate the desired element. One disadvantage of using this method is that it can be time consuming (Harris and Vanderheiden, 1980).

An encoding procedure involves the use of a pattern or code of signals to indicate the desired message (Harris and Vanderheiden, 1980). This pattern or code can be accessed using either a direct select or scanning procedure. Although this method is cognitively more demanding (Harris and Vanderheiden, 1980), it does allow the user access to a greater amount of vocabulary items.

Each of the message transmission methods described can be used with either manual or electronically based communication aids. One example of an electronic communication device which can be accessed using either direct selection, scanning, or encoding procedures is a microcomputer. Additionally, when a microcomputer is employed as a communication device, the user has potential output modes that include print on paper, liquid crystal display (LCD), and/or synthesized speech.

There are advantages and disadvantages to using each of these output modes.

One advantage of a printed output is its intelligibility to individuals in the general community, as well as the potential to be kept in hardcopy form and referred to at a later date (Lloyd and Karlan, 1984). The disadvantages are that it does not facilitate face-to-face interaction and is a "less natural" way of communicating (Lloyd and Karlan, 1984). The "listener" assumes a greater burden during conversation because of these factors. In addition, it is more difficult to communicate at a distance and, in general, can not be transmitted over the telephone unless specialized equipment such as a TTD is used.

A liquid crystal display mode has the same basic advantages and disadvantages as using print on paper. The liquid crystal display, however, is transient and can not be stored in hardcopy for future reference.

Synthesized speech is one of the most recently developed output modes and the topic of this investigation. Next, an overview of speech synthesis, and its advantages and disadvantages, will be provided.

#### An Overview of Speech Synthesis Techniques

There are several different techniques used to produce synthesized speech. All strive to produce

intelligible output with minimal distortion, while using as little computer memory as possible (Shade, 1984).

The highest quality computer-generated speech is produced by digitizing the speech produced by a human speaker. Using this method, acoustic information from the speech waveform is converted into a series of numbers or digital information. Then, the digital information is stored in computer memory and used to recreate the specific sounds and/or messages which have been stored.

The disadvantages of this method are that the user is limited to the vocabulary which has been stored in memory and that it is very expensive. In addition, it can take an enormous amount of computer memory to store a single word or message. The output created, however, is of relatively high quality (Sclater, 1983; Bowe, 1984; Kleiman, 1984; and Shade, 1984).

The speech synthesis technique which is used by the Echo II speech synthesizer is called linear predictive coding (LPC). This technique is based on a mathematical modeling of the human vocal tract which is stored in computer memory. Specific speech properties, such as energy and pitch, are incorporated into this model. Due to the amount of repetitive information involved, this technique can predict portions of the upcoming speech signal. This capability reduces the amount of computer memory required. The use of LPC provides the user with

access to an unlimited vocabulary and is relatively inexpensive. Although this technique does not take up as much computer memory as the one previously described, the quality of the speech is not as good as digitized human speech (Sclater, 1983; and Shade, 1984).

Like the Echo II, the Votrax Type 'N Talk unit uses a text-to-speech technique to produce its speech output. This type of system does not rely on speech which has been previously recorded or digitized. Instead, it stores individual phonemes and the rules for combining them into whole words (Shade, 1984). This technique also allows the user access to an unlimited vocabulary and is fairly inexpensive. Quality, again, does not compare to the first method described.

Two of the most popular and affordable speech synthesizers on the market today are the Echo II and the Votrax Type 'N Talk (TNT) (Reichle, personal communication, Jan. 1984). The Echo II speech synthesizer, manufactured by Street Electronics of Carpinteria, California, retails for approximately \$150. This speech synthesizer consists of a small circuit board which installs into any of slots one through seven of an Apple II, Apple II+, or Apple IIe microcomputer. A small eight ohm speaker plugs into the circuit board allowing for synthesized speech output. The Echo II speech synthesizer operates using a TI 5220 speech processor



chip manufactured by Texas Instrument. The accompanying software allows the user access to four different voice modes ranging from a fixed word vocabulary to a text-to-speech mode. In order to have access to an unlimited vocabulary, the text-to-speech mode was used in this investigation.

The Votrax Type 'N Talk is a text-to-speech synthesizer which utilizes a Votrax SC01 phoneme synthesizer chip and a text-to-speech translation system. It is manufactured by Federal Screw Works of Troy, Michigan and retails for approximately \$275. The Votrax Type 'N Talk is a totally self-contained speech synthesizer housed in a casing approximately the size of a small cassette tape recorder. A connector cable is used to attach the Type 'N Talk unit to almost any microcomputer, including the Apple II, Apple II+, and Apple IIe. The Votrax speech synthesizer does not come with its own speaker, however, any eight ohm speaker will interface with it.

#### Advantages and Disadvantages of Synthesized Speech

Many of the advantages and disadvantages of using synthesized speech output have not been examined empirically. Presumably, synthesized speech provides the user with a more independent means of communicating, thus reducing the amount of burden placed on the listener

(Vanderheiden, 1976). It has also been described as a more "natural" method of communication (Damper, 1982). Speech output makes it possible for the user to communicate with others within a reasonable distance (Lloyd and Karlan, 1984). It can also be used over the telephone, although part of the signal may be degraded during transmission (Damper, 1982). Additionally, Damper (1982) reported that synthesized speech has been described as motivating to use. However, for the novice user or listener it may be intimidating and/or irritating.

In addition to the problems that may plague the speech synthesis user, the text-to-speech mode is disadvantageous in that if the message is forgotten and a repetition requested, the message must be reformulated. Reprogramming the speech synthesizer may be a time-consuming task, especially if the user is physically handicapped (Stoffel, 1982). Additionally, the quality of the voice output for most speech synthesizers (which has been described as: masculine, raspy, and machine-like, Vanderheiden, 1976; and extraterrestrial, Behrmann, 1984) may be considered offensive by some users and listeners.

The phonetic coding involved in using a speech synthesizer in a text-to-speech mode may pose additional problems (Damper, 1982). The English language does not

allow for a one-to-one correspondence between letter and sound. As a result, spelling changes often need to be made when programming a speech synthesizer to deliver a message. The use of spelling changes can be confusing and difficult to learn, especially for those unacquainted with the phonological rules.

### Populations Using Synthesized Speech

Synthesized speech has been used with a wide variety of populations. Synthesized speech can be particularly useful to individuals with speech difficulties such as dysarthria and apraxia (Silverman, 1980). It may also be used with nonreaders as well as persons having physical disabilities, reduced hearing acuity, and/or visual impairments (Damper, 1982; Fons and Gargagliano, 1981; Bowe, 1984; and Kleiman, 1984).

For visually impaired individuals, the use of voice output has many advantages. First, it allows the visually impaired user access to many of the computer's capabilities such as word processing, record keeping, and programming (Kleiman, 1984). Secondly, it is more cost-effective than braille (Holladay, 1983). Additionally, it can eliminate the need to employ sighted readers. This aspect allows the visually impaired person a greater degree of freedom and protects their privacy as well.

Software, which incorporates synthesized speech into its programs, has been developed for special applications such as with the visually impaired as well as for educational and entertainment purposes (Fisher, 1983).

Among the software designed for the visually impaired are programs for wordprocessing, check writing, keeping a calander, filing, and communicating with other computers (Behrmann, 1984). Other educational software which uses synthesized speech output has been developed to teach academic subjects such as spelling, reading, and writing in addition to initial language intervention (Fisher, 1983; Ray, 1984).

### Intelligibility of Synthesized Speech

Ultimately, the value of synthesized speech as a communication aid must be determined as a function of its intelligibility. Intelligibility becomes especially important for those who are going to be using synthesized speech as a primary mode of communication. Synthesized speech "must be instantly intelligible to naive listeners if the user is to communicate effectively with casual acquaintances, such as shop assistants and bus conductors" (Damper, 1982, p. 143).

The intelligibility of any speech depends upon a number of variables. Among these are: the specific task demands, the structure of the signal itself, and human

processing limitations (Nusbaum, Schwab, and Pisoni, 1983). The specific task demands refer to the instructions given to a subject, the subjective expectations of the listener, the size of the response set, and the amount of context provided. An additional task variable that may effect the intelligibility of computer-generated speech may be the amount of practice which a subject has had.

Schwab, Nusbaum, and Pisoni (1983) demonstrated that subjects given training in listening and responding to speech generated by a Votrax Type 'N Talk unit improved in their ability to recognize and respond to this type of synthesized speech over ten days time. The materials used included single words (i.e. PB and MRT lists), sentences (Harvard and Haskins Sentences), and prose passages (e.g. from adult reading tests and modified readings from magazines). On each testing day (Days 1 and 10), subjects listened and responded to two PB lists (100 single words), two MRT lists (100 single words), one Harvard list (10 sentences), one Haskins list (10 sentences), and three prose passages. On training days (Days 2-9), subjects listened and responded to fifty different PB words, 10 Harvard and Haskins sentences, and four prose passages. Subjects were divided into three groups. All groups underwent pre- and post-testing of their ability to understand synthesized speech on days

one and ten respectively. Group one listened to materials presented via synthesized speech on days two through nine of the experiment. Group two listened to the same materials presented via natural speech during that time period. Group three served as a control group and received no training on days two through nine of the experiment.

The results of this experiment indicated that the subjects ability to recognize synthesized single words and words in sentences improved with training. Additionally, response latencies for synthesized speech materials decreased with training. Finally, it was demonstrated that the improvement was not due to memorization of stimulus materials or mastery of experimental procedures. Instead, performance improvement was due to "improved acoustic-phonetic encoding of the synthetic speech" (Schwab, Nusbaum, and Pisoni, 1983, p.14).

Other signal structure variables that influence the intelligibility of synthesized speech include the phonologic, syntactic, semantic, and pragmatic rules in force during stimulus presentations. Additionally, background noise can adversely affect the intelligibility of a signal (Nusbaum, Schwab, and Pisoni, 1983).

Finally, limitations of the human information processing system may influence intelligibility scores

(Nusbaum, Schwab, and Pisoni, 1983). In part, the amount of information with which a person can deal depends on how well they attend to the signal, their past experiences, and how well they can sense the information presented.

All of these variables are important to consider in the study of the intelligibility of synthesized speech. To date, there have been no empirically based investigations that address the intelligibility of low-cost computer-generated speech such as that produced by the Echo II and Votrax Type 'N Talk speech synthesizers. The purpose of this study then was to compare the intelligibility of these two speech synthesizers under three different contextual conditions that included: single words, low probability sentences in which the last word could not be predicted from the preceeding context, and high probability sentences in which the last word could be predicted from the preceeding context. An additional purpose of this study was to examine how subject performance was affected with repeated exposure to a given stimuli within each experimental condition. It was hypothesized that subject performance would improve with repeated exposure to a given stimuli.

## Method

### Procedural Overview

The ability of thirty two adults to verbally repeat recorded natural speech, and two types of recorded synthesized speech (Echo and Votrax) was compared. Each speech type was tape recorded and presented in both single word and each of two sentence forms. Each sentence in the high probability sentence set ended in a word which was highly guessable based on the context provided by accompanying synthesized words. Members of the low probability sentence set ended in a word which could not be predicted based on the preceeding synthesized speech. Each word and sentence was repeated five times within each set. During session one, subjects had their hearing screened and participated in the synthesized speech condition. Votrax and Echo synthesized speech materials were presented randomly within single word and sentence length stimulus presentations. During session two, subjects participated in the natural speech condition. In both conditions, subjects always heard single words first, followed by low probability sentences and then high probability sentences. Subjects responses were transcribed on-line and audiotaped for further analysis and reliability measurements. An error analysis was conducted for all



incorrect responses.

### Subjects

Thirty two subjects, sixteen males and sixteen females, between the ages of 23 and 38 ( $X = 27.0$ ) participated. Subjects were recruited through referral by friends and relatives of the experimenter. All subjects resided in a large metropolitan area in the upper midwest. None of the subjects had any previous experience with computer-generated speech or electronically aided communication systems. All subjects were native speakers of English and had normal speech articulation skills as determined by a screening of their conversational speech. Each subject had his/her hearing screened under earphones using a Grason-Stadler 1701 audiometer. All subjects had air conduction hearing threshold levels of at least 20 dB HL (ANSI, 1969) or better bilaterally at the following frequencies: 250, 500, 1000, 2000, 4000, 6000, and 8000 Hz.

### Stimulus Materials

Twenty seven consonant-vowel-consonant (CVC) words were selected as single word stimuli (SW). Nine of these monosyllabic words were chosen from vocabulary programmed on the Phonic Ear Handivoice (Model 130, 1980). This

vocabulary consists of highly familiar words which are apt to be communicated in interpersonal exchanges (Yoder, personal communication, 1984). The Handivoice is a direct select encoding communication board which produces synthesized words, phrases, and phonemes. Its synthesized speech output is generated using the same microchip as the Votrax speech synthesizer.

The nine Handivoice words were selected so that all place, manner, and voicing features were represented in either the initial or final position of the word. The remaining eighteen words (also CVC's) consisted of nine words which differed from the Handivoice stimuli by the initial phoneme only, and nine which differed by only the final phoneme. These eighteen words were selected in order to determine whether listeners could discriminate between target Handivoice words and similar sounding CVCs. All twenty-seven CVC words were used as stimuli for the single word synthesized speech (Echo and Votrax) condition (see Appendix A).

Two sets of twenty-seven sentences, each between four and eight syllables, were generated using the twenty seven CVC words just described. All CVC words were located in the final position of the sentence. One sentence set consisted of low probability sentences (LP). These were defined as sentences in which the last word could not be predicted from the preceeding words. These

sentences were constructed by placing the carrier phrase "Say the word" in front of each of the twenty-seven CVC words (see Appendix B).

The other sentence set consisted of high probability sentences (HP). These were defined as sentences in which the last word was predicted easily based on the preceeding context (see Appendix C). High predictability was verified by reading all but the last word of each of the sentences to each of fifteen individuals who were not chosen to participate in the treatment conditions. Each individual was instructed to complete each of the twenty-seven sentences by saying what they felt would be the last word of the utterance. Sentences were revised and a new group of individuals was selected to serve as listeners for the revised sentence set. This procedure was replicated until at least eighty percent of fifteen individuals chose the appropriate CVC word to complete each sentence. Performance data are presented in Table 1.

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Insert table 1 about here

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The same twenty seven CVC words used in the synthesized speech condition were used as single word stimuli for the natural speech condition. Each word was randomly presented five times. The same high and low

Table 1. Performance of fifteen normal adults, on a sentence completion task used to determine the predictability of the last word in each of twenty-seven prospective sentences used in the high probability sentence set.

<u>Last Word</u>	<u>Percent Correct</u>
1. yes	100
2. hurt	100
3. watch	93
4. fall	100
5. June	100
6. thing	100
7. bath	100
8. knife	100
9. cab	93
10. less	100
11. yet	93
12. shirt	100
13. heard	100
14. notch	93
15. walk	87
16. wall	100
17. fog	100
18. moon	100
19. Jews	100
20. sing	87
21. thin	93
22. wrath	100
23. bat	80
24. wife	100
25. night	100
26. lab	100
27. cat	100

probability sentence sets were used as stimuli for the natural speech condition. Each sentence was randomly presented five times within each set.

### Stimulus Preparation

The presentation order for single word, low probability, and high probability sentence stimuli was randomized. An Apple II Plus microcomputer was used to drive both the Echo II and the Votrax speech synthesizers. The control card for the Echo II speech synthesizer was inserted into slot 0 of the microcomputer. The frequency, intensity, and duration parameters of the Echo II speech synthesizer were all used as preprogrammed by the manufacturer. The Votrax unit was connected to slot 4.

A computer program, written in Applesoft BASIC language, was designed to alternate between the Votrax speech synthesizer and the text-to-speech mode of the Echo II speech synthesizer (see Appendix D). The program was copied onto three separate diskettes (one diskette was used for single words, another for low probability sentences, and another for high probability sentences). Whenever possible, the target words and sentences were typed using their proper English spelling. However, due to the phonetic rules utilized by each speech

synthesizer, certain spelling changes were made so that each word would be produced using appropriate English pronunciation.

In order to verify that the spelling changes were a closer approximation to the English pronunciation, fifteen individuals (none of whom participated in the main study or the sentence completion task) were asked to compare the intelligibility of stimuli prepared using traditional orthography with those adjusted for more precise phonological integrity. Each participant was seated in an audiological suite in groups of two to five. Each subject was given a response sheet containing the following instructions:

Each word printed on this sheet will be presented twice in succession. Circle which presentation, the first or the second, most closely approximates the standard English pronunciation of that word. If both presentations sound the same, circle "ND" for "no difference".

The words to be presented were displayed on the response sheets along with an example of how each was used in a sentence.

The experimenter was seated at an Apple II Plus microcomputer, with the monitor facing away from the subjects, and typed in the stimulus words. Each word was presented once correctly, and once using the modified spelling. The presentation order of the two versions of each word was randomized. The spelling modifications

used, as well as the percent of subjects who preferred the modified spelling adaptations, are displayed in Table 2. "No difference" responses were counted as correct.

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Insert table 2 about here

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In order to allow adequate time for the subjects to respond, and the experimenter to transcribe the response, five seconds of interstimulus pause time was built into the single word and low probability sentence programs. Seven seconds of interstimulus pause time were built into the high probability sentence program (these sentences were longer in duration, and took more time to transcribe).

The output from each of the speech synthesizers was channeled through a 220 volt mixer and into channel one of a Revox model A77 reel-to-reel tape recorder. Single words and low probability sentences were each recorded onto a separate Ampex 631 reel-to-reel tape. Due to the size of the high probability sentence program, two tapes were required. The recording volume for each program was adjusted so that the stimuli peaked at an average of -3 on the VU meter. A 1000 Hz calibration tone was recorded at the beginning of each tape.

All stimulus materials for the natural speech condition were recorded on Ampex 631 reel-to-reel tape

Table 2. The affect of spelling changes made to correct the pronunciation errors made by the Votrax and Echo speech synthesizers expressed as percent agreement(agreements/agreements + disagreements) that the spelling change improved word intelligibility among 15 normal adult listeners.

Synthesizer	Target Word	Spelling Change	Percent Agreement With Change
Votrax	wear	wair	100%
	splendored	splenderred	93%
	taxi	taksee	93%
	the	thee	67%
	event	evannt	100%
	shoes	shues	93%
	persecuted	pursakuted	73%
	baseball	base ball	100%
	husband	huzband	93%
	study	sta dee	100%
	appreciated	appreesheiated	93%
	computer	compu ter	93%
	today	to day	100%
Echo	wear	wair	93%
	splendored	splendered	73%
	taxi	taksee	93%
	the	thee	47%
	event	evant	100%
	heard	herd	100%
	baseball	base ball	93%
	participating	participaiting	100%
	study	sta dee	100%
	appreciated	appreesheiated	100%
	participation	participaition	93%



using a Dynamic microphone model 635A connected to an Ampex model A77 reel-to-reel tape recorder. A male talker recorded all stimuli using monitored natural speech. Five seconds of pause time was allowed between each stimulus word or sentence. Each separate stimulus type (SW, HP, LP) was recorded on a separate tape. A 1000 Hz calibration tone was recorded at the beginning of each tape.

### Procedures

All experimental sessions took place at the University of Minnesota Speech and Hearing Clinic. Subjects were seated inside a double-walled sound-treated audiological booth, facing away from the experimenter. Two microphones were positioned approximately twelve inches in front of each subject. One microphone was connected to a Panasonic microcassette recorder, model number RN-130, which sat on a small table in front of the subject. The other microphone was connected to a Grason-Stadler 1701 audiometer positioned outside the test booth. Due to equipment failure, the Panasonic microcassette recorder was replaced approximately one-fourth of the way through the experiment by a TEAC V-5RX stereo cassette deck.

Upon arrival, each subject first had their hearing screened. Subjects who passed the hearing screening were read the following instructions:

During this experiment you will listen to 810 computer-generated and recorded voice utterances. Utterances will consist of single words and short sentences. After each block of 270 utterances have been presented, we will take a short break. If at any time during the experiment you find it necessary to stop, please raise your hand. Do not stop the session unless it is absolutely necessary.

Listen carefully to each word or sentence and then repeat it exactly as you heard it. That is, if you hear a word, say the word. If you hear a sentence, say the whole sentence. If you are unsure, please make a best guess. It is preferable to guess rather than to remain silent. Once a response has been made, it can not be changed. You will have five seconds to respond after each utterance. Do you have any questions?

The recording you are about to hear is of computer-generated words. Listen carefully to each word and then repeat it back to me exactly as you heard it.

After the instructions were read, the experimenter placed a set of Grason Stadler earphones on the subject, activated the microcassette recorder, and left the booth. Using the talk forward control on the audiometer, the experimenter notified the subject when the stimulus tape was about to start.

All stimulus tapes were played on a Revox model A77 reel-to-reel tape recorder through a Grason-Stadler 1701 audiometer. The output was channeled into a set of Telephonics TD 39 earphones worn by the subject. The intensity of the playback presentation was adjusted to a

uniform level for all subjects using the prerecorded calibration tone at the beginning of each tape. Stimuli were presented at an average intensity of 70 dB SPL.

All twenty-seven CVC words were used as stimuli for the single word synthesized speech (Echo and Votrax) condition. Each of the twenty-seven words was presented randomly ten times: five times using the Votrax speech synthesizer, and five times using the Echo speech synthesizer.

During experimental conditions, each set of sentences (low probability and high probability) was presented randomly ten times: five times using the Votrax speech synthesizer, and five times using the Echo speech synthesizer. Randomization procedures were the same as those used for the single word stimuli.

All of the subjects' responses were entered on data forms by the experimenter. A plus was recorded for all correct responses. Incorrect responses were recorded using traditional orthographic symbols. Phonetic transcription was used when necessary.

Prior to hearing the low and high probability sentences, subjects were read the following instructions:

The recording you are about to hear is of computer-generated sentences. Listen carefully to each sentence and then repeat the whole sentence back to me exactly as you heard it.

Subjects were given a short break between each set of recordings. During this time, the experimenter changed tapes and readjusted the output level using the prerecorded calibration tone.

Subjects returned to the Speech and Hearing Clinic to participate in the natural speech condition at least two weeks after participating in the synthesized speech conditions. The same instrumentation and procedures as described for the synthesized speech condition were used for the natural speech condition. The instructions, however, were altered to read as follows:

During this experiment you will listen to 405 recorded human voice utterances. Utterances will consist of single words and short sentences. After each block of 135 utterances have been presented, we will take a short break. If at any time during the experiment you find it necessary to stop, please raise your hand. Do not stop the session unless it is absolutely necessary.

Listen carefully to each word or sentence and then repeat it exactly as you heard it. That is, if you hear a word, say the word. If you hear a sentence, say the whole sentence. If you are unsure, please make a best guess. It is preferable to guess rather than to remain silent. Once a response has been made, it can not be changed. You will have five seconds to respond after each utterance. Do you have any questions?

The recording you are about to hear is of computer-generated words. Listen carefully to each word and then repeat it back to me exactly as you heard it.

Prior to hearing the low and high probability sentences, subjects were read the following instructions:

The recording you are about to hear is of human recorded sentences. Listen carefully to each

sentence and then repeat the whole sentence back to me exactly as you heard it.

### Data Reduction

The data obtained were analyzed according to the type of speech (i.e. Votrax, Echo, and Natural), and level of stimulus materials presented (i.e. single word, low probability sentences, and high probability sentences). Further analysis was done to compare subject performance on the two speech synthesizers with stimulus material types collapsed. This analysis revealed that subjects performed significantly better overall with the Votrax speech synthesizer. Therefore, a follow up analysis was performed on the Votrax data to determine whether there were significant differences in subject performance across the three levels of stimulus materials presented.

Subject performance with the Echo speech synthesizer was compared to subject performance for the Votrax speech synthesizer for each level of stimulus materials presented. Additionally, the effect of repeated exposure to each of the twenty seven stimulus words was examined by analyzing subject performance across each of the five presentations of each stimulus word in all three conditions (i.e. single word, low probability and high probability sentences).

An error analysis was performed on all initial and final phonemes produced by the Echo and Votrax speech synthesizers in the single word condition. Data from each individual stimulus word were compiled and entered into initial and final consonant matrices similar to those used in the Broen CVC Articulation Analysis (Broen, 1973). Each matrix listed target phonemes across the top and response phonemes along the side. The number of instances in which a subjects produced a particular response was entered into the appropriate cell of the matrix. Additional cells were added to accommodate the substitution of blends, and two and three syllable words, for initial and final consonants. Cells were also added to show the number of times subjects deleted a particular phoneme, and the number of times no response was emitted for a word containing a target phoneme. The number of times a particular phomeme appeared is listed along the bottom of each column.

### Reliability

An independent observer was used to provide judgements of inter-examiner reliability. The observer listened to and transcribed ten percent of each subjects responses in each condition.

Utterances to be transcribed by the observer were determined by generating a computer-generated random

numbers table for each subject. These tables listed the subject response numbers to be sampled for each subject. The observer was given a cassette tape recording of each subjects responses and copies of the original blank response sheets for each condition (i.e. synthesized and natural speech single word, low probability and high probability sentence conditions). The observer marked the responses to be transcribed on each response sheet. The observer was allowed to listen to each response as many times as necessary before transcribing the response. Observer transcriptions were compared to the experimenters transcriptions. Reliability was computed by dividing the number of agreements by agreements + disagreements and the product multiplied by 100  $[(\text{agreements}/(\text{agreements} + \text{disagreements})) * 100]$ . These results are displayed in table 3.

---

Insert Table 3 about here

---

Table 3. Inter-observer reliability  
 [(agreements/agreements + disagreements) \* 100]  
 for each synthesized and natural speech  
 condition.

	Stimulus Condition		
	Single Words	Low Probability Sentences	High Probability Sentences
Synthesized Speech	98.15%	98.61%	99.77%
Natural Speech	100.00%	100.00%	100.00%



## Results

The first analysis reported scrutinized the differences in intelligibility between Votrax, Echo, and natural speech under each of the three stimulus conditions (single word, low probability, and high probability sentences). The second analysis addressed practice effects with the Votrax and Echo speech types. Individual subject performance for each stimulus word in the single word, low probability, and high probability sentence conditions is displayed in appendices E, F, and G respectively.

### Speech Type and Stimulus Condition Effects

Data were analyzed as a two factor within subjects design. The speech factor consisted of three levels: Votrax, Echo, and natural speech. The condition factor also had three levels: single word, low probability sentences, and high probability sentences. A multivariate approach (using Wilks Lambda criterion) was used to test separated factors. The dependent measure was number of correct responses per condition per speech type.

Results revealed a significant speech by condition interaction ( $F(4,28) = 1053.90$ ,  $p < .0001$ ), as well as speech and condition main effects [ $F(2,30) = 2150.66$ ] and [ $F(2,30) = 1729.43$ , respectively:  $p$ 's  $< .0001$ ]. Simple main effects tests of speech within each level of condition were conducted to follow-up the interaction. Experiment wise, alpha was controlled using Dunn's procedure: i.e.,  $\alpha$  per comparison = .017. All simple main effects were significant: speech within single word [ $F(2,30) = 3701.69$ ], speech within low probability [ $F(2,30) = 1832.96$ ], and speech within high probability [ $F(2,30) = 106.15$ ], all  $p$ 's  $< .0001$ .

All possible (9) pair-wise comparisons were conducted to explicate these effects. Dunn's procedure was repeated setting  $\alpha = \alpha_{EW}/9 = .0056$ . All of these contrasts were significant, except the comparison of Votrax versus Echo within the single word condition (see Table 4).

---

Insert Table 4 about here

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Examination of all cell means revealed that natural speech was superior to speech generated by both the Votrax and the Echo speech synthesizer under all three stimulus conditions. Under both the low and high probability conditions, subjects had significantly more

Table 4. ANOVA summary table of all possible pair-wise comparisons of speech within level of condition.

<u>Comparison</u>	<u>Condition</u>	<u>MS</u>	<u>F</u>	<u>p</u>
Votrax-Echo	SW	159.	2.9	.101
Votrax-Natural	SW	177767.	6416.4	<.0001
Echo-Natural	SW	188573.	3545.2	<.0001
Votrax-Echo	LP	3828.	71.0	<.0001
Votrax-Natural	LP	121713.	2370.5	<.0001
Echo-Natural	LP	168715.	3190.2	<.0001
Votrax-Echo	HP	3192.	76.3	<.0001
Votrax-Natural	HP	4323.	160.9	<.0001
Echo-Natural	HP	14945.	200.3	<.0001

SW = single word  
 LP = low probability  
 HP = high probability

correct responses with stimuli generated by the Votrax, as opposed to the Echo, speech synthesizer. Under the single word condition, this difference was not significant.

### Practice Effects

The effects of practice upon the probability of a correct response were examined in conjunction with speech type (Votrax versus Echo) within stimulus condition (see Appendix H). The five trials on the twenty seven stimulus words were analyzed via a set of three repeated measures ANOVA's: one per condition. Again, a multivariate approach, using Wilks Lambda, was employed.

Under the single word condition, the speech by trial interaction was significant [ $F(4,23) = 3.30, p < .05$ ], whereas the trial main effects was not ( $p's > .1$ ). Partitioning the interaction revealed only a significant group by linear trend interaction [ $t(23) = 3.62, p < .05$ ].

Examining the means (see Table 5) revealed no practice effect for Votrax, and an ascending linear trend for Echo (which by the fifth trial attained a level comparable to Votrax).

---

Insert Table 5 about here

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No significant effects were noted under the low probability condition. However, in the high probability condition, a significant trial main effect emerged [ $F(4,23) = 9.73, p < .0001$ ]. Follow-up analysis revealed significant linear and quadratic trends [ $t's(23) = 6.23$  and  $5.83$  respectively:  $p's < .0001$ ].

#### Error Analysis for Single Words

An error analysis, for initial and final phonemes produced by the Echo and Votrax speech synthesizers in the single word condition, was performed. The results for each individual word are displayed in Appendix I. The combined error analysis results for all initial and final phonemes presented via the Echo and the Votrax speech synthesizers are displayed in Tables 6, 7, 8, and 9.

---

Insert Tables 6, 7, 8, and 9 about here

---

The data in tables 6, 7, 8, and 9 were further analyzed according to how well subjects perceived place,

Table 5. Mean percent of correct responses produced by 32 subjects across each condition for Votrax, Echo, and Natural Speech.

	Single Words	Low Probability	High Probability
	$\bar{X}$	$\bar{X}$	$\bar{X}$
Votrax	21.85%	35.25%	87.79%
Echo	19.51%	23.79%	77.31%
Natural	99.93%	100.00%	99.95%

Table 6. Number and type of initial phoneme errors produced by 32 subjects for words produced by the Votrax speech synthesizer in the single word condition.

	TARGET										
	m	n	b	k	dz	f	th-	s	sh	w	l
m	103	5	1				1			5	
n	1	17		1			1	1			
b	2	1	107	7		12				43	14
d			2	23						3	3
g			1	40							11
p			1	2							
R t				18		1	15	6			4
E k				20							13
S dz					246	5					3
P ch					5				1		
O v			1				1				
N th+			58	10							1
S z							34	14			
E f			2	4		41	1			3	1
th-						1	10				9
s						140	251	136			
sh					5	3			146		105
w		47	4							57	8
l	4	282	42	2		3				177	87
r	2	1	9								4
y			2								67
h				16					1		243
BLENDs*	21	126	78	1	0	44	0	0	1	337	202
3 SYLS**	0	0	0	0	0	0	0	0	0	0	0
2 SYLS***	21	0	2	28	64	34	1	1	11	4	7
DELETED	4	1	3	136	0	23	4	0	0	5	6
NO RESPONSE	2	0	7	12	0	13	1	2	0	6	7
TOTAL:	160	480	320	320	320	320	320	160	160	640	320

\* Signifies that a blend was substituted for the target phoneme.

\*\* Signifies that a three syllable word was produced. These responses were not broken down by phoneme.

\*\*\* Signifies that a two syllable word was produced. These responses were not broken down by phoneme.

Table 7. Number and type of initial phoneme errors produced by 32 subjects for words produced by the Echo speech synthesizer in the single word condition.

TARGET														
	m	n	b	k	dz	f	th-	s	sh	w	l	r	y	h
m	22	324	297	51		5				126	167	106	5	
n	40	86		1						9	14	4	50	
b				1		9	24	7	7	2				33
d							3		1				1	
g				2		1							1	1
p				27		2								18
t						2	1							1
R					5									
E				29		5								
k					227	1								
S					7				3				1	
dz				1					2	1				2
P														
ch														
O														
V														
N			1								1			
th+														
S							1	8						
Z						51	23	8	28		5			62
E				10		7	100	11						2
f														
th-														
s						1	58	90						
sh					2				34				3	
w		14				3				349	5			
l	68	49	16							124	98	11		
r	10						5	2		2	4	36		
y							1						227	
h				25		16	32	14	56	2	1	0	2	93
BLENDS*	8	0	2	0	0	2	16	8	1	5	5	0	15	0
3 SYLS**	0	0	0	0	17	0	0	0	0	0	0	0	0	5
2 SYLS***	12	0	0	3	58	58	9	2	0	4	1	0	5	47
DELETED	0	0	2	144	0	106	40	10	23	1	1	0	1	35
NO RESPONSE	0	7	2	26	3	51	7	0	5	15	18	3	9	21
TOTAL:	160	480	320	320	320	320	320	160	160	640	320	160	320	320

\* Signifies that a blend was substituted for the target phoneme.

\*\* Signifies that a three syllable word was produced. These responses were not broken down by phoneme.

\*\*\* Signifies that a two syllable word was produced. These responses were not broken down by phoneme.



Table 8. Number and type of final phoneme errors produced by 32 subjects for words produced by the Votrax speech synthesizer in the single word condition.

TARGET													
	m	ng	b	d	g	t	k	ch	z	f	th-	s	l
m	29		2				1						
n	390	239	8	4					15				
ng	4	11											
b			115										
d			72	56	40	35	1						
g			2	1	9								
p			4	1	1								
R t			25	35	2	840	28	56		7	29		1
E k					6	3	104	12		9			
S dz				1				12					
P ch							2	223					
O v	1			1									
N th+													
S z			1			1			62	21	5	1	
E f						6				174	1		
th-						7				17	1	1	
s									19	83	198	297	1
sh													
w													5
l	30	62	25	5			1	3					268
r						1							
y													
BLENDS*	0	2	8	1	1	5	2	12	0	8	65	21	3
3 SYLS**	0	0	0	16	0	0	0	0	0	0	0	0	0
2 SYLS***	21	2	35	27	23	58	0	0	64	0	7	0	15
DELETED	3	1	5	2	70	0	17	2	0	0	1	0	17
NO RESPONSE	2	3	18	10	8	4	0	0	0	1	13	0	10
TOTAL:	480	320	320	160	160	960	160	320	160	320	320	320	320

\* Signifies that a blend was substituted for the target phoneme.

\*\* Signifies that a three syllable word was produced. These responses were not broken down by phoneme.

\*\*\* Signifies that a two syllable word was produced. These responses were not broken down by phoneme.

Table 9. Number and type of final phoneme errors produced by 32 subjects for words produced by the Echo speech synthesizer in the single word condition.

	TARGET										
	m	ng	b	d	g	t	k	ch	z	f	th-
m	112	135	3		14			5			
n	336	170	19	4	15	10	1	4	3		4
ng		2					1	2			
b				1	2						
d			1	25	4						
g				8	3		1				
p			34	14	3	32		11			
R t	1		155	11		436		14		3	27
E k			4	3		13	64	10		2	1
S dz											
P ch						88		218			1
O v			1		10		5	1		2	
N th+						1					
S z	1				1	6			34		4
E f			2	1		4	7			265	8
th-			4	3		26	1	6		2	52
s			2	3		59			43	23	149
sh					1						
w											
l				1	6		23			2	76
r			1				5				
y											
BLENDS*	0	2	9	4	2	149	33	20	2	12	61
3 SYLS**	0	0	0	5	0	0	0	0	17	0	0
2 SYLS***	17	6	0	47	58	8	0	0	58	2	0
DELETED	11	0	50	14	3	91	14	19	0	8	9
NO RESPONSE	2	5	35	16	44	31	5	10	3	1	4
TOTAL:	480	320	320	160	160	960	160	320	160	320	320

\* Signifies that a blend was substituted for the target phoneme.

\*\* Signifies that a three syllable word was produced. These responses were not broken down by phoneme.

\*\*\* Signifies that a two syllable word was produced. These responses were not broken down by phoneme.

manner, voicing, and nasality features. Confusion matrices were constructed to display this information as a function of position within a word (i.e. initial or final), and whether the stimulus materials were generated using the Echo or the Votrax speech synthesizer. These matrices are displayed in tables 10 through 25. In constructing these matrices, only the phoneme response data from tables 6, 7, 8, and 9 were used. For example, information on whether subjects correctly perceived place features in the initial position of single words produced by the Votrax speech synthesizer was obtained by consulting table 6. Responses listed under: blends, 3 syllables, 2 syllables, deleted and no response headings were not included in this analysis. The total number of responses analyzed and the total number of possible responses emitted (total number of responses analyzed plus total number of responses listed in categories that were not analyzed) are included on each confusion matrix.

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Insert tables 10-25 about here

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In order to determine which features most often failed to be perceived by subjects, the percent of responses emitted for each feature was calculated using the data from tables 10 through 25. Percentages were calculated using both the total number of responses used

Table 10. Confusion matrix for initial position place errors made for words produced by the Votrax speech synthesizer.

	Stimulus						
	Labial	Dental	Alveolar	Palatal-Alveolar	Palatal	Velar	Glottal
Labial	382	3	61	1	8	13	15
Dental	59	10	1	0	0	10	9
Alveolar	373	301	543	4	40	44	7
Palatal-Alveolar	19	0	1	470	0	0	108
Palatal	2	0	0	1	243	0	1
Velar	1	0	0	0	3	60	24
Glottal	0	0	0	0	0	16	34
Total # Analyzed	836	314	606	476	294	143	198
Total # of Responses	1440	320	960	640	320	320	320

Table 11. Confusion matrix for initial position place errors made for words produced by the Echo speech synthesizer.

		Stimulus						
		Labial	Dental	Alveolar	Palatal-Alveolar	Palatal	Velar	Glottal
Response	Labial	867	47	530	143	5	90	115
	Dental	8	100	12	0	0	0	2
	Alveolar	260	63	345	22	51	1	1
	Palatal-Alveolar	13	5	6	309	3	0	1
	Palatal	0	1	0	0	227	0	0
	Velar	6	0	0	0	1	31	1
	Glottal	18	32	15	56	2	25	93
Total # Analyzed	1172	248	908	530	289	147	213	
Total # of Responses	1440	320	960	640	320	320	320	

Table 12. Confusion matrix for final position place errors made for words produced by the Votrax speech synthesizer.

	Stimulus				
	Labial	Dental	Alveolar	Palatal-Alveolar	Velar
Labial	326	1	8	0	6
Dental	17	1	7	0	0
Alveolar	661	232	1646	59	373
Palatal-Alveolar	0	0	2	235	2
Velar	15	0	4	12	130
Total # Analyzed	1019	234	1667	306	511
Total # of Responses	1120	320	1920	320	640

Table 13. Confusion matrix for final position place errors made for words produced by the Echo speech synthesizer.

Responses	stimulus					
	Labial	Dental	Alveolar	Palatal-Alveolar	Velar	
	417	8	169	17	174	
	6	52	36	6	1	
	547	176	1085	18	216	
	1	5	91	218	6	
	6	1	32	12	71	
	Total # Analyzed	977	242	1413	217	468
	Total # of Responses	1120	320	1920	320	640

R  
e  
s  
p  
o  
n  
s  
e

Table 14. Confusion matrix for initial position manner errors made for words produced by the Votrax speech synthesizer.

	Stimulus			
	Stop	Affricate	Fricative	Approximate
R	352	0	37	134
e				
s	0	251	6	3
p				
o	75	5	778	120
n				
s	411	0	4	691
e				
Total # Analyzed	838	256	825	948
Total # of Responses	1280	320	960	1760



Table 15. Confusion matrix for initial position manner errors made for words produced by the Echo speech synthesizer.

	Stimulus			
	Stop	Affricate	Fricative	Approximate
R				
e				
s	880	5	67	538
p	0	234	4	1
o	12	3	422	76
n	182	0	129	954
s				
e				
Total #				
Analyzed	1074	242	622	1569
Total # of				
Responses	1280	320	960	1760

Table 16. Confusion matrix for final position manner errors made for words produced by the Votrax speech synthesizer.

	Stimulus			
	Stop	Affricate	Fricative	Approximate
R	2072	68	60	1
e				
s	3	235	0	0
p				
o	17	0	880	1
n				
s	124	3	0	273
e				
Total # Analyzed	2216	306	940	275
Total # of Responses	2560	320	1120	320

Table 17. Confusion matrix for final position manner errors made for words produced by the Echo speech synthesizer.

	Stimulus			
	Stop	Affricate	Fricative	Approximate
R				
e				
s				
p				
o				
n				
s				
e				
Stop	1637	46	50	229
Affricate	88	218	8	0
Fricative	138	7	835	1
Approximate	36	0	2	76
Total # Analyzed	1899	271	895	306
Total # of Responses	2560	320	1120	320

Table 18. Confusion matrix for initial position voicing errors made for words produced by the Votrax speech synthesizer.

		Stimulus	
		+ Voice	- Voice
R e s p o n s e	+ Voice	1748	172
	- Voice	151	796
Total Analyzed		1899	968
Total # of Responses		3040	1280

Table 19. Confusion matrix for initial position voicing errors made for words produced by the Echo speech synthesizer.

		Stimulus	
		+ Voice	- Voice
R e s p o n s e	+ Voice	2631	198
	- Voice	107	571
Total Analyzed		2738	769
Total # of Responses		3040	1280

Table 20. Confusion matrix for final position voicing errors made for words produced by the Votrax speech synthesizer.

		Stimulus	
		+ Voice	- Voice
R e s p o n s e	+ Voice	1456	85
	- Voice	97	2099
Total Analyzed		1553	2184
Total # of Responses		1920	2400

Table 21. Confusion matrix for final position voicing errors made for words produced by the Echo speech synthesizer.

		Stimulus	
		+ Voice	- Voice
R e s p o n s e	+ Voice	1212	82
	- Voice	284	1793
Total Analyzed		1496	1875
Total # of Responses		1920	2400

Table 22. Confusion matrix for initial position nasality errors made for words produced by the Votrax speech synthesizer.

		Stimulus	
		+ Nasal	- Nasal
R e s p o n s e	+ Nasal	126	43
	- Nasal	339	2824
Total # Analyzed		465	2867
Total # of Responses		640	3680



Table 23. Confusion matrix for initial position nasality errors made for words produced by the Echo speech synthesizer.

		Stimulus	
		+ Nasal	- Nasal
R e s p o n s e	+ Nasal	472	1475
	- Nasal	141	1419
Total # Analyzed		613	2894
Total # of Responses		640	3680

Table 24. Confusion matrix for final position nasality errors made for words produced by the Votrax speech synthesizer.

		Stimulus	
		+ Nasal	- Nasal
R e s p o n s e	+ Nasal	673	30
	- Nasal	93	2941
Total # Analyzed		766	2971
Total # of Responses		800	3520

Table 25. Confusion matrix for final position nasality errors made for words produced by the Echo speech synthesizer.

		Stimulus	
		+ Nasal	- Nasal
R e s p o n s e	+ Nasal	755	308
	- Nasal	2	2306
Total # Analyzed		757	2614
Total # of Responses		800	3520

in the feature analysis, and the total number of responses possible for each feature. It is suspected that the true percentage lies somewhere between these two figures. For example, in the case of two syllable word substitutions, the feature may have been preserved, however, the nature of the response does not lend itself to an exact analysis. The percentage data for each feature, according to whether it was in the initial or final position of a target word, is displayed in tables 26 through 33.

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Insert tables 26-33 about here

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The results of this percentage analysis for the place feature in the initial position of words, in general, revealed the following. Labial sounds were perceived as either labial or alveolar when produced by the Votrax speech synthesizer. In general, when produced by the Echo speech synthesizer, labial sounds were perceived correctly. Dental sounds were perceived as alveolar when produced by the Votrax speech synthesizer and as either dental or alveolar when produced by the Echo speech synthesizer. Alveolars were perceived correctly when produced using Votrax and as labials when using Echo. Palatal-alveolars were generally perceived correctly regardless of the speech synthesizer used.

Table 26. Percent of responses emitted for the place feature in the initial position of words generated using synthesized speech.

		Stimulus											
		Labial		Dental		Alveolar		Palatal-Alveolar		Palatal		Velar	
		Votrax	Echo	Votrax	Echo	Votrax	Echo	Votrax	Echo	Votrax	Echo	Votrax	Echo
Labial	#R/Total A.	46%	74%	1%	19%	10%	58%	0%	27%	3%	2%	9%	61%
	#R/Total	27%	60%	1%	15%	6%	55%	0%	22%	3%	2%	4%	28%
Dental	#R/Total A.	7%	1%	3%	40%	0%	1%	-	-	-	0%	7%	-
	#R/Total	4%	1%	3%	31%	0%	1%	-	-	-	0%	3%	-
Alveolar	#R/Total A.	45%	22%	96%	25%	90%	38%	1%	4%	14%	18%	31%	1%
	#R/Total	26%	18%	94%	20%	57%	36%	1%	3%	13%	16%	14%	0%
Palatal-Alveolar	#R/Total A.	2%	1%	-	2%	0%	1%	99%	58%	-	1%	-	-
	#R/Total	1%	1%	-	2%	0%	1%	73%	48%	-	1%	-	-
Palatal	#R/Total A.	0%	-	-	0%	-	-	0%	-	83%	79%	-	-
	#R/Total	0%	-	-	0%	-	-	0%	-	76%	71%	-	-
Velar	#R/Total A.	0%	1%	-	-	-	-	-	-	1%	0%	42%	21%
	#R/Total	0%	0%	-	-	-	-	-	-	1%	0%	19%	10%
Glottal	#R/Total A.	-	2%	-	13%	-	2%	-	11%	-	1%	1%	17%
	#R/Total	-	1%	-	10%	-	2%	-	9%	-	1%	5%	8%
Total #		836	1172	314	248	606	908	476	530	294	289	143	198
Analized													
Total # of													
Responses		1440	1440	320	320	960	960	640	640	320	320	320	320

#R/Total A. = Number of Responses for that feature divided by the total number of responses encompassed in this analysis.

#R/Total = Number of Responses for that feature divided by the total number of instances where that feature occurred.

Table 27. Percent of responses emitted for the place feature in the final position of words generated using synthesized speech.

	Stimulus									
	Labial		Dental		Alveolar		Palatal-Alveolar		Velar	
	Votrax	Echo	Votrax	Echo	Votrax	Echo	Votrax	Echo	Votrax	Echo
Labial										
#R/Total A.	32%	43%	0%	3%	0%	12%	-	6%	1%	37%
R #R/Total	29%	37%	0%	2%	0%	9%	-	5%	1%	27%
e Dental										
#R/Total A.	2%	1%	0%	21%	0%	3%	-	2%	-	0%
p #R/Total	2%	1%	0%	16%	0%	2%	-	2%	-	0%
o Alveolar										
#R/Total A.	65%	56%	99%	73%	99%	77%	19%	7%	73%	46%
s #R/Total	59%	49%	73%	55%	86%	57%	18%	6%	58%	34%
e Palatal-Alveolar										
#R/Total A.	-	0%	-	2%	0%	6%	77%	80%	0%	1%
#R/Total	-	0%	-	2%	0%	5%	73%	68%	0%	1%
Velar										
#R/Total A.	1%	1%	-	0%	0%	2%	4%	4%	25%	15%
#R/Total	1%	1%	-	0%	0%	2%	4%	4%	20%	11%
Total # Analyzed	1019	977	234	242	1667	1413	306	271	511	468
Total # of Responses	1120	1120	320	320	1920	1920	320	320	640	640

#R/Total = Number of Responses for that feature divided by the total number of instances where that feature occurred.

#R/Total A. = Number of Responses for that feature divided by the total number of responses encompassed in this analysis.

Table 28. Percent of responses emitted for the manner feature in the initial position of words generated using synthesized speech.

		Stimulus							
		Stop		Affricate		Fricative		Approximate	
		Votrax	Echo	Votrax	Echo	Votrax	Echo	Votrax	Echo
R e s p o n s e	Stop								
	#R/Total A.	42%	82%	-	2%	4%	11%	14%	34%
	#R/Total	28%	69%	-	2%	4%	7%	8%	31%
	Affricate								
s p o n s e	#R/Total A.	-	-	98%	97%	1%	1%	0%	0%
	#R/Total	-	-	78%	73%	1%	0%	0%	0%
	Fricative								
	#R/Total A.	9%	1%	2%	1%	94%	68%	13%	5%
	#R/Total	6%	1%	2%	1%	81%	44%	7%	4%
Approximate									
#R/Total A.	#R/Total A.	49%	17%	-	-	0%	21%	73%	61%
	#R/Total	32%	14%	-	-	0%	13%	39%	54%
Total # Analyzed		838	1074	256	242	825	622	948	1569
Total # of Responses		1280	1280	320	320	960	960	1760	1760

#R/Total A. = Number of responses for that feature divided by the total number of responses encompassed in this analysis.

#R/Total = Number of responses for that feature divided by the total number of instances where that feature occurred.

Table 29. Percent of responses emitted for the manner feature in the final position of words generated using synthesized speech.

	Stimulus							
	Stop		Affricate		Fricative		Approximate	
	Votrax	Echo	Votrax	Echo	Votrax	Echo	Votrax	Echo
Stop								
#R/Total A.	94%	86%	22%	17%	6%	6%	0%	75%
#R/Total	81%	64%	21%	14%	5%	4%	0%	72%
Affricate								
#R/Total A.	0%	5%	77%	80%	-	1%	-	-
#R/Total	0%	3%	73%	68%	-	1%	-	-
Fricative								
#R/Total A.	1%	7%	-	3%	94%	93%	0%	0%
#R/Total	1%	5%	-	2%	79%	75%	0%	0%
Approximate								
#R/Total A.	6%	2%	1%	-	-	0%	99%	25%
#R/Total	5%	1%	1%	-	-	0%	85%	24%
Total # Analyzed	2216	1899	306	271	940	895	275	306
Total # of Responses	2560	2560	320	320	1120	1120	320	320

#R/Total A. = Number of responses for that feature divided by the total number of responses encompassed in this analysis.

#R/Total = Number of responses for that feature divided by the total number of instances where that feature occurred.



Table 30. Percent of responses emitted for the voicing feature in the initial position of words generated using synthesized speech.

		Stimulus			
		+ Voice		- Voice	
R e s p o n s e		Votrax	Echo	Votrax	Echo
	+ Voice				
	#R/Total A.	92%	96%	18%	26%
	#R/Total	58%	87%	13%	15%
	- Voice				
	#R/Total A.	8%	4%	82%	74%
	#R/Total	5%	4%	62%	45%
Total # Analyzed		1899	2738	968	769
Total # of Responses		3040	3040	1280	1280

#R/Total A. = Number of responses for that feature divided by the total number of responses encompassed in this analysis.

#R/Total = Number of responses for that feature divided by the total number of instances where that feature occurred.

Table 31. Percent of responses emitted for the voicing feature in the final position of words generated using synthesized speech.

		Stimulus			
		+ Voice		- Voice	
R e s p o n s e		Votrax	Echo	Votrax	Echo
	+ Voice				
	#R/Total A.	81%	94%	4%	4%
	#R/Total	63%	76%	3%	4%
	- Voice				
	#R/Total A.	19%	6%	96%	96%
	#R/Total	15%	5%	75%	87%
Total # Analyzed		1496	1553	1875	2184
Total # of Responses		1920	1920	2400	2400

#R/Total A. = Number of responses for that feature divided by the total number of responses encompassed in this analysis.

#R/Total = Number of responses for that feature divided by the total number of instances where that feature occurred.

Table 32. Percent of responses emitted for the nasality feature in the initial position of words generated using synthesized speech.

		Stimulus			
R e s p o n s e		+ Nasality		- Nasality	
		Votrax	Echo	Votrax	Echo
	+ Nasality				
	#R/Total A.	77%	27%	51%	1%
	#R/Total	74%	20%	40%	1%
	- Nasality				
	#R/Total A.	23%	73%	49%	99%
	#R/Total	22%	53%	39%	77%
	Total #				
	Analyzed	613	465	2894	2867
Total # of Responses		640	640	3680	3680

#R/Total A. = Number of responses for that feature divided by the total number of responses encompassed in this analysis.

#R/Total = Number of responses for that feature divided by the total number of instances where that feature occurred.

Table 33. Percent of responses emitted for the nasality feature in the final position of words generated using synthesized speech.

		Stimulus			
		+ Nasality		- Nasality	
		Votrax	Echo	Votrax	Echo
Response	+ Nasality				
	#R/Total A.	88%	100%	1%	12%
	#R/Total	84%	94%	1%	9%
	- Nasality				
	#R/Total A.	12%	0%	99%	88%
	#R/Total	12%	0%	84%	66%
Total # Analyzed		766	757	2971	2614
Total # of Responses		800	800	3520	3520

#R/Total A. = Number of responses for that feature divided by the total number of responses encompassed in this analysis.

#R/Total = Number of responses for that feature divided by the total number of instances where that feature occurred.

However, subjects did perform better when the Votrax speech synthesizer was used. Velars were perceived as velars or alveolars when produced by the Votrax speech synthesizer and as labials when the Echo speech synthesizer was used. The glottal sound was perceived as a palatal-alveolar when produced by the Votrax speech synthesizer and as a labial when the Echo was used.

In the final position of words the following general statements can be made with regard to place features. Labials were perceived as alveolars with Votrax and as alveolars or labials with Echo. Dentals were perceived as alveolars regardless of the speech synthesizer used. Alveolars and palatal-alveolars were perceived correctly regardless of the type of synthesizer used. Velars were perceived as alveolars when produced by the Votrax speech synthesizer and as either alveolars or labials when the Echo speech synthesizer was used.

An analysis of manner cues in the initial position of words revealed, in general, the following results. Stops were perceived as approximates when produced by the Votrax speech synthesizer. When produced by the Echo speech synthesizer, stops were generally perceived correctly. Subjects correctly identified affricates and approximates regardless of the speech synthesizer used. Fricatives, in general, also tended to be perceived correctly regardless of the speech synthesizer type,

although subjects did perform somewhat better when Votrax was used.

Final position stops, fricatives, and affricates were perceived correctly regardless of the speech synthesizer used. Approximates were perceived correctly when produced by the Votrax speech synthesizer, however, when the Echo speech synthesizer was used they tended to be perceived as stops.

Voicing cues, in the initial position of words, were perceived correctly. However, subjects tended to perceive voiceless cues somewhat better when produced by the Votrax speech synthesizer. In the final position, voicing cues were also tended to be perceived correctly regardless of the speech synthesizer used.

Generally, initial position nasal sounds were perceived correctly when produced by the Votrax speech synthesizer. When produced by the Echo speech synthesizer these sounds were often perceived as non-nasal. Non-nasal sounds were correctly perceived when produced by the Echo speech synthesizer. When produced by the Votrax speech synthesizer, however, they were just as likely to be perceived as nasal.

Both nasal and non-nasal sounds were, for the most part, perceived correctly in the final position of words. Nasal sounds were perceived correctly more often when produced by the Echo speech synthesizer. Non-nasal

sounds were correctly perceived more often when produced by the Votrax speech synthesizer.

### Discussion

The results of this investigation revealed that both the type of speech presented and the level of stimulus materials used significantly effected subject performance. This finding held true for all possible comparisons of speech type versus condition, except when the Votrax and Echo speech synthesizers were compared at the single word level.

The results of intelligibility comparisons indicated that the use of natural speech stimuli was far more intelligible than stimuli generated by either the text-to-speech mode of the Echo II speech synthesizer or the Votrax Type 'N Talk speech synthesizer. These results were the same across all levels of stimulus materials presented.

A comparison between the two speech synthesizers revealed that the Votrax Type 'N Talk speech synthesizer produced speech that was more intelligible than that produced by the text-to-speech mode of the Echo II speech synthesizer in both low and high probability sentence conditions. In the single word condition, however, no significant difference was found between the two speech synthesizers. Failure to find differences during the single word condition may have been due to the poor



intelligibility of single words produced by both speech synthesizers. That is, there may have been a basal effect during the single word condition.

Subject performance with the Votrax speech synthesizer was significantly better than with stimuli produced by the Echo speech synthesizer for both sentence sets. Although the intelligibility data from the high probability sentences were superior when compared to all other synthesized speech materials, it should be pointed out that only the last word was scored in each sentence. In some cases, subjects responded correctly to the last word, but, made numerous mistakes with the preceeding context. Thus, subject performance might actually be poorer than these data reflect.

The finding that subjects were more proficient in identifying target words that were part of a sentence (regardless of whether that word was contained in a low probability sentence or a high probability sentence) has significant implications for the use of synthesized speech in both production and comprehension tasks. For production, results of the current investigation would appear to support teaching synthesized speech users to produce short phrases and/or sentences rather than single words in isolation (e.g. using "I am hungry" rather than just "hungry"). It also appears to suggest that the phrases or sentences used be predictable in nature (e.g.

when it is mealtime, the phrase "I am hungry" could be produced). Using a target word in a phrase or sentence should help the user's listener to decode a message the first time it is heard. For the severely handicapped individual using synthesized speech output, repeating a message can be a time-consuming and frustrating task. Repeating a message also requires more listener time and patience. Consequently, placing a target word within a predictable sentence could help to eliminate speaker and listener difficulties during a conversation in which synthesized speech is used.

One question that may arise is whether using phrases and sentences would be more difficult than single words for the user of an augmentative communication system to learn and use. Multiple word speech output does not necessarily imply that the multiple symbols must be used. Instead, the learner could be taught a single symbol which could stand for a multiple word synthetic speech utterance. For example, the learner could be taught the bliss symbol for "shirt". The synthesized speech produced when this symbol was activated on the communication board could say, for example, "This is a shirt". In this case, the learner need only be taught the object label and not necessarily the whole phrase.

In terms of comprehension, Blaisdell and Jensen (1973) reported that subjects are more likely to attend

to critical word elements embedded in longer natural speech sentences as long as these key elements are stressed. They also demonstrated that embedding key elements within a string of other words increases intelligibility, even when that string of words is relatively unrelated. Thus, when presenting natural speech stimuli to listeners, there is no evidence to suggest that sentence presentation will harm comprehension. With respect to synthesized speech, it seems logical to speculate that sentence length stimuli might actually facilitate understanding, defined in terms of intelligibility. Further investigation needs to be done to determine how well the handicapped user of synthesized speech would understand sentence length stimuli as opposed to single words. Additionally, for the handicapped user, exposure to meaningful sentences may have a positive impact in their acquisition of semantic/syntactic rules based upon recent literature suggesting the valuable aspects of modeling more complex language behavior subsequent to learner produced utterances (Branston, 1979).

Several reasons have been presented to favor the use of sentence length synthesized speech materials, especially since the intelligibility of single words was so poor. If, however, performance could be expected to improve over time when using single words, then this may

be a viable option. Therefore, the effects of repeated exposure to synthesized speech stimuli were examined. For single words, performance remained consistent over time with the Votrax speech synthesizer and improved over time with the Echo speech synthesizer. Therefore, it appears that with the Votrax speech synthesizer using single word output, there would be no reason to expect intelligibility scores to improve with repeated exposure. If the Echo speech synthesizer was used with single word output, however, there would be reason to expect that intelligibility scores would improve over time, however, at best, it would improve to the same level achieved throughout with Votrax. Therefore, it would seem logical to use the Votrax speech synthesizer when presenting single word stimuli, instead of the Echo speech synthesizer, as subject performance would be at its peak from the beginning.

No significant differences in performance were noted over time for either the Echo or the Votrax speech synthesizer when low probability sentences were presented. The data did, however, show a trend toward improvement in performance with both speech synthesizers over time. Additionally, although the results did not reach significance, it was noted that subjects performed better with low probability sentences presented with the Votrax speech synthesizer.

The data for repeated exposure to high probability sentences indicated that subjects performed significantly better when the sentences were presented via the Votrax speech synthesizer. Regardless of which speech synthesizer was used to present high probability sentences, subject performance would be expected to improve significantly over time.

As referred to in the introduction, Schwab, Nusbaum, and Pisoni (1983) also examined the effects of practice with synthetic speech over time. Subjects were presented with different stimuli during practice sessions, as opposed to being presented with repeated exposure to the same stimuli over a single session as in the present investigation. Schwab, Nusbaum, and Pisoni found that practice listening to speech generated by the Votrax speech synthesizer brought about significant improvement in subject performance with single word and sentence materials. In the present study, the only significant improvement noted over repeated presentations of the same stimuli was for the high probability sentence materials. Perhaps the fact that the single word condition was presented first, and that subjects had only one exposure to it (rather than multiple exposures as in the study by Schwab et.al.) may explain why no significant improvement in subject performance in the current investigation was

observed. Further research needs to be done in this area.

Even though subject performance would be expected to improve over time in some conditions, this would not be helpful for individuals who use synthesized speech as their sole means of communication in many novel environments. It is suspected that if a synthesized speech user is thrust constantly into new environments, the synthesized speech may detract from rather than facilitate interactions. For these novel situations then, printed output or print plus synthesized speech, may be superior to synthesized speech alone.

Additionally, as the data illustrate, the intelligibility of synthesized speech, even after subjects have had practice with it, is greatly inferior to the intelligibility of natural speech. Natural speech would, therefore, be the preferred choice among speech output modes. However, due to the computer memory limitations and other variables discussed previously, it is not always practical to use natural speech output. Therefore, if synthesized speech was the output mode selected, it would appear to be best to choose the Votrax speech synthesizer over the Echo speech synthesizer, and to use high probability sentences containing multiple contextual cues whenever possible.

Regardless of the speech synthesizer used, an error analysis of responses emitted for single word stimuli revealed that listeners, in general, correctly perceive manner, voicing, and nasality features. The place feature, however, was much more difficult for listeners to perceive correctly regardless of the type of speech synthesizer used or the position of the target phoneme within the word.

The acoustic cues for place of articulation are generally determined by attending to the transition of the second formant (Fry, 1979). The data presented in this investigation would suggest that the second formant transitions generated by both speech synthesizers do not adequately represent this property of the vocal tract. In order to remedy this problem, the manufacturers of these two speech synthesizers must restructure the programming of the second formant transition so that place distinctions can be perceived more clearly. It is suspected that this factor alone may contribute greatly to improving the intelligibility of these two speech synthesizers.

Although intelligibility is a critical factor in selecting speech synthesis as an output mode, the correspondence between intelligibility and listener preference for a particular speech synthesizer is unclear. In order to examine this relationship more

closely, subject's subjective opinions were recruited. Two paragraphs, one generated by the Echo speech synthesizer, and one generated by the Votrax speech synthesizer, were played to subjects at the conclusion of this experiment. Subjects were then asked to indicate which paragraph they preferred. Thirty of the thirty-two subjects in this investigation preferred the speech generated by the Votrax speech synthesizer.

Regardless of which speech synthesizer is used, the intelligibility data, even for high probability sentences, is poor even under ideal conditions where listeners are wearing headphones and there is no background noise or other distractors to contend with. It is suspected that under more natural conditions, such as in a school or home setting, the intelligibility data would be even worse making single words almost totally unintelligible and sentences less than immediately understandable.

As Schwab, Nusbaum, and Pisoni (1983) point out "if a particular text-to-speech system is going to be used routinely on a daily basis by the same person, it may be difficult to predict daily performance with the synthetic speech by that individual from group recognition scores obtained with inexperienced subjects in a one-hour testing session in the laboratory" (p.14).



Further research needs to be done, in more natural settings to determine exactly how the intelligibility of synthesized speech is effected by such factors as background noise. It is suspected that these variables would have very adverse effects on intelligibility. Additional research should also be done with populations such as the blind and severely handicapped to determine how well they can understand and use synthesized speech. It would also be interesting to investigate how exposure to synthesized speech effects speech and language development and comprehension in delayed populations.

As the data indicate, certain features such as place and manner of articulation, are not always perceived correctly by listeners. Additional research, in which these acoustic parameters are systematically varied, needs to be done to determine specific ways in which the intelligibility of the Echo and Votrax speech synthesizers can be improved.

Until further research is done, it is advisable that given a choice, the Votrax Type N' Talk speech synthesizer be used instead of the text-to-speech mode of the Echo II speech synthesizer. Additionally, stimuli should be presented in sentence form whenever possible, and the environment should be free of background noise and other distractions. Listeners should be given

training time to become familiar with synthesized speech especially when sentence length materials are used.

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## Appendix A

Words used in the single word condition.

1. yes
2. hurt
3. watch
4. fall
5. June
6. thing
7. bath
8. knife
9. cab
10. less
11. yet
12. shirt
13. heard
14. notch
15. walk
16. wall
17. fog
18. moon
19. Jews
20. sing
21. thin
22. wrath
23. bat
24. wife
25. night
26. lab
27. cat

## Appendix B

Sentences used in the low probability sentence condition.

1. Say the word yes.
2. Say the word hurt.
3. Say the word watch.
4. Say the word fall.
5. Say the word June.
6. Say the word thing.
7. Say the word bath.
8. Say the word knife.
9. Say the word cab.
10. Say the word less.
11. Say the word yet.
12. Say the word shirt.
13. Say the word heard.
14. Say the word notch.
15. Say the word walk.
16. Say the word wall.
17. Say the word fog.
18. Say the word moon.
19. Say the word Jews.
20. Say the word sing.
21. Say the word thin.
22. Say the word wrath.
23. Say the word bat.
24. Say the word wife.
25. Say the word night.
26. Say the word lab.
27. Say the word cat.

## Appendix C

Sentences used in the high probability sentence condition.

1. Say either no or yes.
2. I cry when my feelings are hurt.
3. On my wrist I wear a watch.
4. Leaves change color in the fall.
5. The first month of summer is June.
6. Love is a many splendored thing.
7. Get in the tub and take a bath.
8. Cut the bread with a knife.
9. He drives a taxi cab.
10. I believe it more or less.
11. The event has not happened yet.
12. He bought a short-sleeved shirt.
13. That was the sound I heard.
14. Tighten the belt one more notch.
15. Put on your shoes and take a walk.
16. Hang the picture on the wall.
17. Her new coat was a London Fog.
18. The dog barked at the full moon.
19. Hitler persecuted the Jews.
20. That is the song they will sing.
21. One is thick and one is thin.
22. He read the Grapes of Wrath.
23. We need a new baseball and bat.
24. They are now husband and wife.
25. It was very dark last night.
26. The scientist works in his lab.
27. They have a dog and a cat.



## Appendix D

An Applesoft BASIC computer program designed to alternate between stimuli generated by the Votrax and the Echo II speech synthesizers.

```
5  REM ***** TALKER COMPARISON *****
7  GOTO 60
10 REM ***** ECHO SUBROUTINE *****
12 READ T$
14 IF T$ = "END" THEN GOTO 5000: REM  END OF LIST
16 PRINT CHR$ (4)"PR#0": REM  ECHO
18 PRINT T$
20 X = 0
22 X = X + 1
24 IF X = > 100 THEN GOTO 28
26 GOTO 22
28 RETURN
30 REM ***** VOTRAX SUBROUTINE *****
32 READ T$
34 IF T$ = "END" THEN GOTO 5000: REM  END OF LIST
36 PRINT CHR$ (4)"PR#4": REM  VOTRAX
38 PRINT T$
40 X = 0
42 X = X + 1
44 IF X = > 100 THEN GOTO 48
46 GOTO 42
48 RETURN
60 REM *****
90 REM  DATA STORAGE SECTION
92 REM  LAST DATA ELEMENT MUST BE 'END'
95 REM *****
100 DATA  "FALL", "JUNE", "KNIFE", "NIGHT"
105 REM  DATA CONTINUED
990 DATA  "END"
1000 REM *****
1005 REM  PROGRAM EXECUTION SECTION
1010 REM *****
1012 PRINT CHR$ (4)"BRUN TEXTALKER"
1014 GOSUB 10
1016 GOSUB 30
1018 REM  CONTINUE FROM HERE
5000 PRINT CHR$ (4)
5005 HOME : VTAB 10: HTAB 10: PRINT "END OF LIST": END
```

# Appendix E

Subject Responses for the Speech Synthesized Word "Yes" in the Single Word Conditions.

SUBJECT	VOTRAX PRESENTATION NUMBER					ECHO PRESENTATION NUMBER				
	1	2	3	4	5	1	2	3	4	5
1	+	+	+	+	+	+	+	+	+	+
2	+	+	+	+	+	+	+	+	+	+
3	+	+	+	+	+	+	+	+	+	+
4	+	+	+	+	+	+	+	+	+	+
5	+	+	+	+	+	+	+	+	+	+
6	+	+	+	+	+	+	+	+	+	+
7	+	+	+	+	+	+	+	+	+	+
8	+	+	+	+	+	+	NURSE	+	+	+
9	+	+	+	+	+	+	+	YET	YET	+
10	+	+	+	+	+	+	+	+	+	+
11	GLASS	GLASS	+	+	GLASS	+	+	+	+	+
12	+	+	+	+	+	+	+	+	+	+
13	NEST	NEST	NEST	NEST	NEST	NURSE	NURSE	NURSE	NURSE	NURSE
14	+	+	+	+	+	+	+	+	+	+
15	+	+	+	+	+	+	+	+	+	+
16	+	+	YES	+	+	YER	YER	YERJ	YERCH	YERS
17	GLASS	NEST	NEST	NEST	NEST	NEST	NEST	NEST	NEST	NEST
18	+	+	+	+	+	+	+	+	+	+
19	+	+	+	+	+	NEST	NEST	NEST	NEST	NEST
20	+	+	+	+	+	NER	NURSE	NERF	NURSE	NURSE
21	+	+	+	+	+	+	+	+	+	+
22	+	+	+	+	+	+	+	+	+	+
23	+	+	+	+	+	+	+	+	+	+
24	+	NYES	+	NYES	NYES	+	NYES	NYES	NYES	NYES
25	LESS	LEST	LEST	LESS	LESS	+	+	+	+	+
26	GLASS	GLASS	GLASS	GLASS	GLASS	NURSE	NURSE	NURSE	NURSE	NURSE
27	+	+	NYES	NYES	NYES	NYES	NYES	NYES	NYES	NYES
28	+	+	+	+	+	+	+	+	+	+
29	+	+	+	+	+	+	+	+	+	+
30	+	+	NEST	NEST	NEST	+	NEST	NEST	NEST	NEST
31	+	+	+	+	+	+	+	+	+	+
32	+	+	+	+	+	+	YE	+	+	YACK
NUMBER CORRECT:	27	26	25	25	24	25	21	22	22	22

# Appendix E

Subject Responses for the Speech Synthesized Word "Hurt" in the Single Word Conditions.

SUBJECT	VOTRAX PRESENTATION NUMBER					ECHO PRESENTATION NUMBER				
	1	2	3	4	5	1	2	3	4	5
1	SHIRT	SHIRT	SHIRT	SHIRT	SHIRT	FIRST	HERPS	FIRST	FIRST	FUR
2	CARROT	EARTH	EARTH	CARROT	CARROT	ERT	ERT	ERT	ERT	EARTH
3	SHIRT	SHIRT	SHIRT	SHIRT	SHIRT	FIRST	FIRST	FIRST	PERST	FIRST
4	SHIRT	SHIRT	SHIRT	SHIRT	SHIRT	NR	NR	FIRST	NR	+
5	SHIRT	SHIRT	SHIRT	SHIRT	SHIRT	+	+	+	+	+
6	CARROT	CARROT	CARROT	CARROT	CARROT	+	HURTS	HURTS	HURTS	+
7	CARROTS	CARROT	CARROTS	CARROTS	CARROTS	FIRST	FIRST	FIRST	FIRST	FIRST
8	SHIRT	SHIRT	SHIRT	SHIRT	SHIRT	+	+	+	+	+
9	CARROT	CARROT	CARROT	CARROT	CARROT	FUR	FUR	FUR	FUR	FUR
10	CARROT	CARROT	CARROT	CARROT	CARROT	+	+	+	HER	+
11	CURT	CURT	SHIRT	SHIRT	SHIRT	FERN	FUR	FUR	FUR	FUR
12	CARROT	CARROT	CARROT	CARROT	CARROT	HER	HER	HER	HER	HER
13	CARROT	CARROT	CARROT	CARROT	CARROT	+	FIRST	FIRST	FIRST	FIRST
14	SHIRT	SHIRT	SHIRT	SHIRT	CURT	PURSE	PURSE	FUR	PURSE	PURSE
15	SHIRT	+	SHIRT	+	SHIRT	HER	HER	HER	HER	HER
16	ERT	ERT	ERT	YERT	GERT	ERT	+	ER	ER	HER
17	CARROT	CARROT	CARROT	CARROT	CARROT	FUR	FUR	FUR	FUR	FUR
18	SHIRT	SHIRT	SHIRT	SHIRT	SHIRT	+	FIRST	FIRST	FIRST	+
19	BIRD	EARTH	EARTH	EARTH	SKIRT	EARTH	EARTH	EARTH	EARTH	EARTH
20	SHIRT	SHIRT	SHIRT	SHIRT	SHIRT	BIRD	TURN	BURR	BIRD	BURR
21	SHIRT	SHIRT	SHIRT	SHIRT	SHIRT	FIRST	FIRST	FIRST	FIRST	FIRST
22	CURT	CURT	CURT	CURT	CURT	+	ERT	ERTS	+	+
23	SHIRT	SHIRT	SHIRT	SHIRT	SHIRT	+	+	+	+	+
24	SHIRT	SHIRT	SHIRT	SHIRT	SHIRT	PERCH	PERCH	PERCH	PERCH	PERCH
25	+	+	+	+	+	HER	HER	HER	HER	HER
26	+	+	+	+	+	+	+	+	+	+
27	ERF	ERT	BERK	GERK	ERST	VERT	ERP	BURP	ERF	BURP
28	SHIRT	SHIRT	+	SHIRT	SHIRT	HER	HER	+	+	+
29	N/R	N/R	+	EARTH	+	+	+	+	+	+
30	CARROT	CARROT	CARROT	CARROT	SHIRT	+	+	+	+	+
31	CARROT	+	CARROT	CARROT	CARROT	BURP	+	+	+	BURP
32	SHIRT	SHIRT	SHIRT	SHIRT	SHIRT	N/R	N/R	BURR	+	VERP
NUMBER										
CORRECT:	2	4	4	3	3	11	9	9	10	12

# Appendix E

## Subject Responses for the Speech Synthesized Word "Watch" in the Single Word Conditions

SUBJECT	VOTRAX PRESENTATION NUMBER					ECHO PRESENTATION NUMBER				
	1	2	3	4	5	1	2	3	4	5
1	+	+	BLOTCH	+	+	MUCH	MUCH	MUCH	MUCH	MUCH
2	BLOTCH	BLOTCH	BLOTCH	BLOTCH	BLOTCH	MON	MA	MA	MA	MA
3	BLOTCH	BLOTCH	BLOTCH	BLOTCH	BLOTCH	MARCH	MARCH	MARCH	MARCH	MARCH
4	BLOTCH	BLOTCH	BLOTCH	BLOTCH	BLOTCH	NR	ONCE	NR	+	+
5	BLOTCH	BLOTCH	BLOTCH	BLOTCH	BLOTCH	MONTH	MUCH	MUCH	LOTCH	LOTCH
6	LOCK	BLOTCH	LOTCH	LOTCH	LOTCH	MARCH	NR	NR	NOTCH	NOTCH
7	BLOTCH	BLOTCH	BLOTCH	BLOTCH	BLOTCH	MOTCH	MOTCH	MATCH	+	+
8	BLOTCH	BLOTCH	BLOTCH	BLOTCH	LOTCH	+	MUCH	+	+	+
9	BLACK	BLOTCH	BLOTCH	BLOTCH	BLOTCH	MOP	MOP	MOP	LONG	LONG
10	BLOTCH	BLOTCH	BLOTCH	BLOTCH	BLOTCH	MUCH	NR	MUCH	LOTCH	LOTCH
11	LODGE	LODGE	LODGE	LODGE	LODGE	MALT	MALT	MALT	MALTOH	MALTOH
12	PLOTCH	BLOTCH	BLOTCH	LOTCH	BLOTCH	MARCH	MARCH	MARCH	MOTCH	MOTCH
13	BLOT	BLOT	BLOT	BLOT	BLOT	MOCK	NR	MARCH	MARCH	MARCH
14	BLOTCH	BLOTCH	LOTCH	BLOTCH	LOTCH	NOTCH	NOTCH	NOTCH	NOTCH	NOTCH
15	BLAH	BLOT	BLOCK	BLOT	BLOT	MARCH	WALK	NR	LA	MERK
16	BLOTCH	BLOTCH	BLOTCH	BLOTCH	BLOTCH	MAR	MARCH	MOTCH	MOTCH	MOTCH
17	BLACK	BLOT	BLOCK	BLOTCH	BLOCK	+	+	+	+	+
18	+	BLOTCH	BLOTCH	+	BLOTCH	N/R	LUNCH	WHAT	+	+
19	WALL	WALL	WALL	+	MUCH	MUCH	MUCH	LOVE	MUCH	UCH
20	+	+	+	+	+	MOP	MOP	MOM	MOTH	MOTH
21	BLOT	BLOT	BLOT	BLOT	BLOT	MUCH	MUCH	MUCH	MUCH	MUCH
22	BLOTCH	BLOTCH	BLOTCH	BLOTCH	BLOTCH	MATCH	MATCH	MUCH	MUCH	MUCH
23	LOT	LOT	LOT	LOT	LOT	WATT	WATT	LOT	LOT	LOT
24	BLOTCH	BLOTCH	BLOTCH	BLOTCH	LOTCH	MUCH	MOTCH	MARCH	MOTCH	MOTCH
25	BLOCK	BLOCK	BLAH	BLOCK	BLOTCH	ONE	ONE	N/R	MOM	MOM
26	BLOCKED	BLOCKED	BLOCKED	BLOCKED	LOCKED	LUNCH	LUNCH	LUNCH	LUNCH	LUNCH
27	OTS	BLOTCH	BLOTCH	BLOTCH	BLOTCH	MOTCH	MA	MUT	MUCH	MUCH
28	BLOTCH	BLOTCH	BLOTCH	BLOTCH	BLOTCH	NOT	MARCH	NOT	+	+
29	BLOTCH	BLOTCH	BLOTCH	BLOTCH	BLOTCH	MARCH	MARCH	MARCH	MARCH	MARCH
30	BLOTCH	BLOTCH	BLOTCH	BLOTCH	BLOTCH	MARCH	MARCH	MARCH	MARCH	MARCH
31	BLOT	BLOT	BLOT	BLOT	BLOT	MARCH	MUCH	+	MUCH	MUCH
32	BLOCKED	BLOTCH	BLOTCH	BLOTCH	BLUTCH	LUCK	LUCK	LUCK	LUCK	LUCK

NUMBER  
CORRECT:

3 2 1 4 2 2 1 3 6 6

# Appendix E

Subject Responses for the Speech Synthesized Word "Fall" in the Single Word Conditions.

SUBJECT	VOTRAX PRESENTATION NUMBER					ECHO PRESENTATION NUMBER				
	1	2	3	4	5	1	2	3	4	5
1	+	SHAWL	+	+	+	UM	PHONE	HOME	PHONE	PHONE
2	SAUL	SAUL	SAUL	SAUL	SAUL	UN	ON	ON	ON	ON
3	+	+	+	+	+	N/R	HOME	HOME	HOME	HOME
4	BALL	N/R	BALL	BALL	TALL	FUN	FUN	N/R	FUN	N/R
5	SMALL	SMALL	SAUL	SAUL	SAUL	UM	UM	UM	UM	UM
6	SOW	SOW	SOW	SOW	SOW	N/R	ON	ON	ON	ON
7	SAUL	+	SAW	SAUL	SAUL	THUMB	UM	UM	UM	FUN
8	SAUL	SAUL	SWALLOW	SWALLOW	SWALLOW	PHONE	HOME	PHONE	HOME	FOAM
9	LALL	LALL	+	+	+	UM	THUMB	PHONE	THUMB	BLUM
10	+	+	+	+	+	UN	UN	ON	ON	UN
11	+	+	+	+	+	UM	UM	AWLM	POEM	PALM
12	SAUL	SUL	SAUL	SAUL	SAUL	UM	ON	ON	ON	UN
13	N/R	SAUL	SAUL	SAUL	SAUL	N/R	ON	HOME	FOAM	HOME
14	SAUL	SAUL	SAUL	SAUL	SAUL	BUMP	BUM	BUM	BUMP	BUM
15	+	+	+	+	UL	UL	+	UL	UL	+
16	SAUL	SAUL	SLALL	SAUL	SHALL	UM	UM	HOME	HOME	UM
17	SOIL	SAUL	SOLID	SOLID	ALL	PHONE	PHONE	PHONE	PHONE	PHONE
18	STALL	STALL	STALL	STALL	STALL	COME	COME	COME	COME	COME
19	+	+	+	+	+	ONE	ALL	ALL	BALL	+
20	+	+	BALL	BALL	BALL	UM	UM	BOMB	BALL	MOM
21	SAUL	SAUL	SAUL	SAUL	SAUL	UGG	UGG	UN	UGG	UGG
22	SAUL	SAUL	SAUL	THALL	SAUL	OLD	ULL	ULL	ULL	ALL
23	N/R	SOW	SOW	SOW	SOW	N/R	THUMB	THUMB	THUMB	THUMB
24	SLALL	SHALL	JELALL	JELALL	JELALL	GULL	ULL	ALL	ULL	ULL
25	SALT	SAUL	SAUL	SUL	SALT	ONE	FUN	FUN	FUN	FUN
26	N/R	SAUL	SAUL	SAUL	SAUL	N/R	FUN	FUN	FUN	FUN
27	ULL	ULL	ULL	ULL	ULL	UM	UM	OOM	OF	UM
28	+	N/R	ALL	ALL	ALL	ON	ON	ON	ON	ON
29	+	BALL	BALL	BALL	BALL	HOME	PHONE	HOME	HOME	OWN
30	SALT	SALE	SOLID	SOLID	SOLID	PHONE	FUN	PHONE	PHONE	PHONE
31	+	+	+	+	+	MOM	FUN	+	FUM	FULL
32	SAUL	BALL	SAUL	BALL	SAUL	UM	PHONE	PHONE	PHONE	PHONE
NUMBER CORRECT:	10	8	8	8	7	0	1	1	0	2

# Appendix E

Subject Responses for the Speech Synthesized Word "June" in the Single Word Conditions.

SUBJECT	VOTRAX PRESENTATION NUMBER					ECHO PRESENTATION NUMBER				
	1	2	3	4	5	1	2	3	4	5
1	+	+	+	+	+	+	+	+	+	+
2	+	+	+	+	+	TWO	+	+	+	+
3	+	+	+	+	+	TWO	+	+	+	+
4	+	+	+	+	+	+	+	+	+	+
5	+	+	+	+	+	JUM	+	+	SOON	+
6	+	+	+	+	+	+	+	+	+	+
7	+	+	+	+	+	+	+	+	+	+
8	+	+	+	+	+	+	+	+	+	+
9	+	+	+	+	+	+	+	+	+	+
10	+	+	+	+	+	+	+	+	+	+
11	+	+	+	+	+	+	+	+	+	+
12	+	+	+	+	+	TWO	+	+	+	+
13	+	+	+	+	+	+	+	+	+	+
14	+	+	+	+	+	+	+	+	+	+
15	+	+	+	+	+	+	+	+	+	+
16	+	+	+	+	+	+	+	+	+	+
17	+	+	+	+	+	+	+	+	+	+
18	+	+	+	+	+	JEW	+	+	+	+
19	+	+	+	+	+	TWO	+	+	+	+
20	+	+	+	+	+	+	+	JEW	JEWS	+
21	+	+	+	+	+	JUTE	+	+	+	+
22	+	+	+	+	+	+	+	+	+	+
23	+	+	+	+	+	+	+	+	+	+
24	+	+	+	+	+	+	+	+	+	+
25	+	+	+	+	+	TWO	+	+	+	+
26	+	+	+	+	+	+	+	+	+	+
27	+	+	JUNE	+	JUNE	+	+	JEW	JUNE	+
28	+	+	+	+	+	+	+	+	+	+
29	+	+	+	+	+	+	+	+	+	+
30	+	+	+	+	+	+	+	+	+	+
31	+	+	+	+	+	+	+	+	+	+
32	+	+	+	+	+	+	+	+	+	+
NUMBER										
CORRECT:	32	32	31	32	31	24	32	30	29	32

## Appendix E

Subject Responses for the Speech Synthesized Word "Thing" in the Single Word Conditions.

SUBJECT	VOTRAX					ECHO				
	PRESENTATION NUMBER					PRESENTATION NUMBER				
	1	2	3	4	5	1	2	3	4	5
1	SIN	SIN	SIN	SIN	SIN	SING	THIN	THIN	THIN	THIN
2	SIN	SIN	SIN	ZIN	ZIN	IN	IN	IN	IN	IN
3	SIN	SIN	SIN	SIN	THIN	SIN	WOMEN	WOMEN	WOMEN	WOMEN
4	SIN	SIN	SIN	SIN	SIN	N/R	SIN	N/R	N/R	SIN
5	TEN	TEN	TEN	SIN	SIN	HIM	HIM	HIM	HIM	HIM
6	N/R	ZIN	SING	THIN	ZIN	IN	IN	IN	IN	IM
7	SIN	SIN	SIN	SIN	SIN	THIN	THIN	THIN	THIN	THIN
8	SIN	SIN	SING	SIN	SIN	THIN	HIM	HIM	THIN	THIN
9	SIN	SIN	SIN	THIN	THIN	THIN	THIN	THIN	THIN	THIN
10	SELL	SELL	SELL	SELL	SELL	BIM	BIM	BIM	BIM	BIM
11	SALE	SALE	SALE	SALE	SELL	N/R	FUME	FUME	FUME	FUME
12	THIN	ZIN	ZIN	ZIN	ZIN	THIN	THIN	THIN	THIN	THIN
13	SIN	SIN	SIN	SIN	SIN	SWIM	SWIM	SWIM	SWIM	SWIM
14	SIN	SIN	SILL	SILL	SILL	N/R	FIM	FIM	SIM	SIM
15	SING	SING	SING	SING	SING	BIM	TIM	HIM	HIM	HIM
16	ZAIDEL	ZAEL	ZAEL	ZAEL	ZELL	IM	OOM	HIM	IM	FIM
17	TIN	TEN	TIN	TIN	TIN	THIN	THIN	THIN	THIN	THIN
18	SIN	SIN	SIN	SIN	SIN	SIN	SIN	SIN	SIN	SIN
19	SIN	SIN	SIN	SIN	SIN	SIN	SIN	SIN	SIN	SIN
20	SIN	SIN	SIN	SIN	SIN	SWIM	ROOM	SWIM	YOUM	SWIM
21	SIN	SIN	SIN	SIN	SIN	SIN	THIN	THIN	THIN	THIN
22	SILL	SILL	TILL	SILL	SILL	BIM	BIM	BIM	BIM	THIN
23	SIN	SIN	SIN	SIN	SIN	THIN	THIN	THIN	THIN	THIN
24	VEIL	ZAIL	ZELL	ZELL	ZELL	IM	IM	IM	IM	IM
25	SIN	SIN	SIN	SIN	SIN	SIN	SIN	SIN	SIN	THIN
26	SIN	SIN	SIN	SIN	SIN	SIN	THIN	THIN	THIN	THIN
27	ILL	ELLE	I	SILL	THILL	IM	IM	IM	THIM	BIM
28	SIN	SIN	SIN	SIN	SIN	IN	THIN	THIN	THIN	THIN
29	SIN	SIN	SIN	SIN	SIN	SIN	SIN	THIN	THIN	THIN
30	SIN	SIN	SIN	SIN	SIN	SIN	SIN	SIN	SIM	SIN
31	SIN	SIN	SIN	SIN	SIN	DIM	HIM	HIM	HIM	HIM
32	SIN	SIN	SIN	SIN	SIN	THIM	BIN	FIM	FIM	BIN

NUMBER  
CORRECT:

0 0 0 0 0 0 0 0 0 0 0

# Appendix E

Subject Responses for the Speech Synthesized Word "Bath" in the Single Word Conditions.

SUBJECT	VOTRAX PRESENTATION NUMBER					ECHO PRESENTATION NUMBER				
	1	2	3	4	5	1	2	3	4	5
1	GLASS	BASS	BATS	LESS	BEST	MERTH	MASK	MESS	MATH	MASS
2	BESS	THAT	THAT	BAT	THAT	MESS	LESS	MESS	MESS	LESS
3	LAST	BLESS	BLESS	LESS	BLESS	MISS	MASS	MESS	MASS	MISS
4	N/R	N/R	N/R	N/R	BEST	MESS	MESS	MESS	MESS	MESS
5	PASS	BEST	BET	BET	BET	MESS	MESS	MESS	MESS	MESS
6	LESS	N/R	BATS	BASS	ES	MESS	N/R	MASS	MATH	MATH
7	BASKET	BASS	+	BEST	BEST	MASK	MASK	MASK	MATH	MASK
8	LAST	REST	LESS	REST	BEST	MESS	MESS	MESS	MESS	MESS
9	GLASS	GLASS	GLASS	GLASS	BASS	MATH	LASK	MAT	MATH	MAT
10	BLAST	BLASS	GLASS	GLASS	GLASS	MASS	MASK	MASS	MASS	MASS
11	GLASS	GLASS	GLASS	GLASS	GLASS	MATH	MATH	MATH	MATH	MATH
12	BASS	BASS	BASS	THAT	GLASS	MATH	MATH	MASS	MATH	MATH
13	THAT	THAT	BAT	BAT	THAT	MASK	MATH	MASK	MASK	MASK
14	BASS	BASS	BASS	BASS	BLESS	MASK	MASK	MASS	MASS	MASS
15	LESS	LESS	LESS	LESS	BLESS	MESS	MESS	MESS	MESS	MESS
16	BLASS	BLASS	BLESS	VESS	BASS	MA	MER	MERTH	MERF	MER
17	GLASS	GLASS	GLASS	GLASS	CLASS	MATH	MATH	MATH	MATH	MATH
18	FAST	BEST	BEST	BEST	BLESS	MISS	MISS	MESS	MATCH	MESS
19	REST	REST	REST	REST	WEST	MESS	MESS	MASS	MESS	MESS
20	DRESS	DRESS	DRESS	DRESS	DRESS	EARTH	MERF	MISS	MERF	MAN
21	BLESS	LAST	LAST	LESS	LESS	MESS	MESS	LESS	MESS	MESS
22	LESS	BESS	BESS	LESS	BESS	MASS	MASS	MASS	MAFF	MATH
23	LESS	LESS	LESS	LESS	LESS	LESS	LESS	LESS	LESS	LESS
24	LESS	BLESS	BLESS	BLESS	BLESS	MAT	THAT	MA	MA	MATCH
25	LESS	LESS	LET	LESS	LESS	MESS	MESS	MESS	MESS	MAT
26	GLASS	GLASS	GLASS	GLASS	GLASS	GLASS	GLASS	MATH	MATH	MATH
27	BESS	DESS	AFF	BUS	BUS	MESS	MESS	MESS	MESS	MUSS
28	LESS	LESS	LESS	BLESS	BLESS	MAN	MAN	MAT	MAT	MAT
29	BLESS	BEST	BEST	BET	BEST	MESS	MESS	MESS	MESS	MESS
30	GLASS	THAT	GLASS	BASKET	GLASS	MASK	MASK	MASK	MASK	MASK
31	GLASS	SPLAT	THIS	BEST	BEST	MESS	MAT	MESS	MAPS	MATH
32	BLESS	N/R	BLISS	LET	BLESS	MET	MAT	MAT	MAT	MAT

NUMBER

CORRECT: 0 0 1 0 0 0 0 0 0 0 0



# Appendix E

Subject Responses for the Speech Synthesized Word "Knife" in the Single Word Conditions.

SUBJECT	VOTRAX					ECHO				
	PRESENTATION NUMBER					PRESENTATION NUMBER				
	1	2	3	4	5	1	2	3	4	5
1	RICE	WIFE	WIFE	WIFE	WISE	LIFE	LIFE	LIFE	LIFE	LIFE
2	LIFE	LIFE	LIFE	LIFE	LIFE	LIFE	LIFE	+	LIFE	LIFE
3	LIFE	LIFE	LIFE	LIFE	LIFE	WIFE	WIFE	LIFE	WIFE	LIFE
4	NICE	LIFE	WIFE	WIFE	WIFE	+	+	+	+	+
5	LIFE	LIFE	LIFE	LICE	NICE	+	+	+	+	+
6	LIFE	LIFE	LIFE	LIFE	LIFE	+	+	+	+	+
7	LICE	LICE	LICE	LICE	LIFE	+	+	+	+	+
8	LIFE	LIFE	LIFE	LIFE	LIFE	+	WIFE	+	+	+
9	LIFE	LIFE	LIFE	BLIFE	BLIFE	+	+	+	+	+
10	LIFE	LIFE	LIFE	BLIFE	LIFE	MIFE	MIFE	MIFE	MIFE	MIFE
11	LIFE	LIFE	LIFE	LIES	LIES	WIFE	WIFE	WIFE	WIFE	WIFE
12	LICE	LICE	WIFE	BLIFE	LIFE	LIFE	WIFE	MIFE	WIFE	MIFE
13	LICE	LIFE	LIFE	BLITHE	LIFE	WIFE	+	NR	WIFE	+
14	BLITHE	LICE	LICE	BLIFE	BLIFE	MICE	MICE	MICE	MIFE	MICE
15	LIFE	LIFE	LIFE	LIFE	LIFE	LIFE	LIFE	LIFE	LIFE	LIFE
16	BLIFE	BLIKE	BLIKE	BLIKE	BLIKE	MULT	MUL	MOLF	MULF	MAWLF
17	LIGHTS	LICE	LIFE	LIFE	LIFE	+	+	+	+	+
18	LIES	LIES	LIES	LIES	LIES	WIFE	LIFE	LIFE	LIFE	LIFE
19	NICE	LIFE	LIFE	LIFE	LIFE	LIFE	LIFE	LIFE	LIFE	LIFE
20	LIFE	LIFE	WIFE	WIFE	WIFE	MONTH	MONTH	MONTH	MONTH	MONTH
21	LICE	LICE	LICE	BLITH	LIFE	MICE	MICE	MITH	MIFE	LIFE
22	LIES	LIES	LIFE	LIFE	BLIFE	+	MIFE	MIFE	MIFE	+
23	LIFE	LIFE	LIFE	LIFE	LIFE	LIFE	LIFE	LIFE	LIFE	LIFE
24	LICE	LICE	LICE	LICE	LICE	MY	MY	MY	MY	MY
25	LICE	LICE	LICE	LICE	LICE	MICE	MICE	MICE	MICE	MICE
26	LICE	LICE	LICE	LICEP	LICEP	+	+	+	+	+
27	LICE	LICE	IFE	LIFE	LITHE	MIFE	MIFE	+	MITH	MIFE
28	LICE	LIFE	LIFE	LIFE	LIFE	+	+	+	+	+
29	LICE	LICE	LICE	LICE	LICE	+	+	+	+	+
30	LIGHT	LICE	LICE	LIGHT	LICE	MICE	MICE	MICE	MICE	MICE
31	LICE	LICE	LICE	LICE	SPLICE	MICE	MICE	+	+	+
32	LIFE	WIFE	WIFE	WIFE	WIFE	MIKE	MIGHT	MIKE	MIGHT	MIGHT

NUMBER										
CORRECT:	0	0	0	0	0	11	10	13	11	13

# Appendix E

Subject Responses for the Speech Synthesized Word "Cab" in the Single Word Conditions.

SUBJECT	VOTRAX					ECHO				
	PRESENTATION NUMBER					PRESENTATION NUMBER				
	1	2	3	4	5	1	2	3	4	5
1	TAB	TAP	ABB	ABB	TABLE	FAT	AT	AT	HAT	AP
2	ADD	ADD	AEBLE	AEBLE	AEBLE	AT	CAT	AE	AE	AE
3	HEEL	TELL	TELL	TELL	DELL	N/R	N/R	N/R	MAP	MAP
4	N/R	N/R	N/R	N/R	N/R	FAT	N/R	N/R	N/R	N/R
5	HEAD	ELB	AEB	EBB	LEB	AE	AE	PANTS	AE	HEAD
6	N/R	N/R	AL	N/R	AEDLE	NR	NR	NR	NR	AE
7	TEB	TADDLED	TADDLE	TADDLE	TADDLE	AT	AT	AE	AT	AT
8	HEAD	EBB	EBB	EBB	EBB	HAT	HAT	HAT	HAT	HAT
9	TABLET	+	TAB	TAB	GAB	AT	AT	FAT	AT	AT
10	ELLE	ELLE	ELLE	ELLE	ELLE	AT	ET	AT	MAT	AT
11	N/R	KELL	N/R	N/R	BELL	CAT	CAT	CAT	MATH	FAT
12	THAT	TAD	BAT	THAT	GLAT	AE	AE	AE	AE	AT
13	DAB	GAB	GAB	GAB	DAB	AT	N/R	N/R	CAP	N/R
14	DAD	TABLE	TABLE	TABLE	DABBLE	N/R	N/R	HAT	CAP	CAP
15	APT	TABLE	TABLE	ABLE	TABLE	HALF	AT	AT	AT	AT
16	AT	AEDLE	AEDLE	AE	AEBLE	ET	A	AE	AE	AE
17	DEAD	DEB	DEBT	DEB	LAB	CAT	CAT	CAT	CAT	PAT
18	AT	AT	AT	AT	AT	AT	AT	PET	AT	AT
19	BED	BED	BED	EBB	EBB	AT	CAT	AT	CAT	MAP
20	GAB	TABLE	TABLE	CABLE	TABLE	GUN	CAR	GUN	MINE	PAN
21	AFF	TAN	ADD	AT	TAD	AT	AT	FAT	AT	AT
22	GAL	GAL	GEL	GAL	GAL	AE	AE	AE	AE	AE
23	AT	AT	AT	AT	AT	AT	AT	HAT	AT	AT
24	E	A I	ADD	AB.L	AB.L	AE	E	AE	HAE	AE
25	EBB	EBB	EBB	EBB	EBB	AT	AT	AT	AT	AT
26	DAB	DAB	DAB	DAB	DAB	CAT	CAT	CAT	N/R	AT
27	ABB	ABB	ABB	GAB	GEB	AT	AT	AT	ASS	AE
28	GAB	GAB	GAB	GAB	GAB	AT	AT	AT	CAT	AT
29	EBB	EBB	EBB	EBB	EBB	ACT	ACT	AT	N/R	N/R
30	TAB	TAB	TAB	TAB	TAB	PAT	PAT	PAT	PAT	PAT
31	ED	GUM	ED	GET	ED	AT	AT	HAM	AT	AT
32	EBB	EBB	EBB	EBB	EBB	FAT	N/R	PACK	MAT	AT

NUMBER										
CORRECT:	0	1	0	0	0	0	0	0	0	0

# Appendix E

Subject Responses for the Speech Synthesized Word "Less" in the Single Word Conditions.

SUBJECT	VOTRAX					ECHO				
						PRESENTATION NUMBER				
	1	2	3	4	5	1	2	3	4	5
1	BLISS	GLASS	BLISS	BLISS	BLISS	FIRST	FIRST	FIRST	+	+
2	+	+	+	+	+	WES	+	+	+	+
3	BLESS	BLESS	BLESS	+	BLESS	MISS	MESS	DRESS	REST	MESS
4	GLASS	GLASS	GLASS	GLASS	GLASS	N/R	MESS	MESS	+	MESS
5	GLASS	BLESS	BLESS	BLESS	BLESS	MERTH	MESS	MESS	+	+
6	BLESS	+	+	+	+	+	+	+	+	+
7	GLASS	GLASS	GLASS	GLASS	GLASS	MASK	+	MASK	MASK	MASK
8	GLASS	+	+	BLESS	BLESS	MERSE	REST	MESS	REST	REST
9	GLASS	GLASS	GLASS	GLASS	GLASS	FIT	LIST	LIST	+	LET
10	GLASS	GLASS	GLASS	GLASS	GLASS	MERSE	MASK	MESS	FEST	MESS
11	GLASS	GLASS	GLASS	GLASS	GLASS	MERTH	MATH	MATH	MATH	MATH
12	GLASS	GLASS	GLASS	BLESS	BLESS	MISS	MESS	MESS	MESS	MESS
13	GLASS	GLASS	GLASS	GLASS	LAST	MESS	NURSE	NURSE	NURSE	NURSE
14	LASS	BLESS	BLESS	BLESS	+	N/R	N/R	+	+	+
15	+	+	+	+	+	+	+	+	+	+
16	BLESS	BLESS	BLESS	BLESS	BLESS	MERZ	MERSE	MERSE	MERCH	MERZ
17	GLASS	GLASS	GLASS	GLASS	GLASS	MESS	MESS	MESS	MESS	MESS
18	GLASS	GLASS	GLASS	GLASS	BLESS	MISS	+	+	+	+
19	REST	EARTH	LIST	REST	WEST	MESS	NEST	MESS	NEST	NEST
20	DRESS	DRESS	DRESS	DRESS	LIST	MARS	MERF	MIRROR	NURSE	NURSE
21	BLESS	BLESS	BLESS	BLESS	BLESS	+	+	+	+	BLESS
22	+	+	BLESS	BLESS	BLESS	LIST	+	BLESS	+	+
23	+	+	+	+	+	+	+	+	+	+
24	+	+	BLESS	+	+	MERSE	MESS	MESS	MESS	MESS
25	+	+	+	+	LEST	MESS	LEST	+	+	LEST
26	GLASS	GLASS	GLASS	GLASS	GLASS	LISP	+	LISP	LISP	MASK
27	+	GLESS	+	GLESS	GLESS	MERSE	MESS	MERSE	MESS	MESS
28	+	+	+	BLESS	BLESS	+	+	+	+	+
29	BLESS	GLASS	BLESS	BLESS	BLESS	NURSE	NURSE	+	MESS	MESS
30	GLASS	GLASS	GLASS	GLASS	GLASS	MASS	MESS	MESS	MESS	MASK
31	GLASS	GLASS	GLASS	GLASS	LIST	HURT	MESS	MESS	NURSE	MESS
32	BLESS	BLISS	BLESS	BLISS	BLESS	+	LET	NET	LET	MAT

NUMBER  
CORRECT: 8 9 8 7 6 6 10 10 14 10

# Appendix E

Subject Responses for the Speech Synthesized Word "Yet" in the Single Word Conditions.

SUBJECT	VOTRAX					ECHO				
	42	76	84	173	254	25	28	64	169	253
1	+	+	+	+	+	SHIRT	NERTS	GERPS	+	+
2	+	+	+	+	+	YER	YOUR	YES	+	+
3	+	+	+	+	+	N/R	YOURS	YES	YES	YES
4	+	+	+	+	+	YES	YES	YES	YES	YES
5	+	+	+	+	+	YOURS	SHIRT	+	+	+
6	+	+	+	+	+	N/R	YANZ	YES	YANZ	YANZ
7	+	YES	+	+	+	+	+	YANZ	YES	YES
8	DEAD	+	+	+	+	N/R	HURT	HURT	+	+
9	+	+	+	+	+	+	+	+	+	+
10	+	+	+	+	+	YER	YER	YES	YES	YES
11	CAT	CAT	GLAD	+	GLAD	N/R	N/R	YES	YES	YES
12	+	+	+	+	+	YEH	+	YES	+	+
13	NET	NET	NET	NET	NET	N/R	N/R	N/R	NURSE	NURSE
14	+	+	+	+	+	YERT	YERT	YERP	+	YES
15	+	+	+	+	+	YES	+	YE	+	+
16	+	+	+	+	+	YERT	YERT	YERT	YERCH	YERCH
17	NET	NET	NET	NET	NET	MET	NET	NET	NET	NET
18	+	+	+	+	+	YES	YES	YES	+	+
19	+	+	+	GET	+	EARTH	SHIRT	NAP	MAPS	NEST
20	MET	MET	MET	+	+	NERF	NERF	MER	NURSE	MER
21	+	+	+	+	+	YES	+	+	YES	YUP
22	NYET	NYET	LEEYET	+	+	NYET	NYET	NYES	+	+
23	+	+	+	+	+	+	+	+	+	+
24	+	+	NYET	NYET	NYET	NYETCH	NYETCH	NYETCH	NYETCH	NYETCH
25	+	LET	LET	LET	LET	YES	YES	YES	YES	YES
26	MET	GLAD	MET	MET	MET	N/R	NERT	NERT	NERT	NERT
27	LEK	NYET	LET	NYET	NET	NERT	NERT	NYETS	NYET	NYET
28	+	+	+	+	+	+	+	+	+	+
29	+	+	+	+	+	+	+	+	+	+
30	NET	+	+	NET	NET	+	DIRT	NET	NET	NET
31	+	+	+	+	+	YERN	CHURCH	YERN	YES	YES
32	LET	+	LET	+	+	YACK	YACK	YACK	YACK	+
NUMBER CORRECT:	22	23	22	24	24	6	8	6	13	13

# Appendix E

Subject Responses for the Speech Synthesized Word "Shirt" in the Single Word Conditions.

SUBJECT	VOTRAX					ECHO				
	PRESENTATION NUMBER					PRESENTATION NUMBER				
	1	2	3	4	5	1	2	3	4	5
1	+	+	+	+	+	SHIRPS	FIRST	FIRST	URPST	URPST
2	+	+	+	+	+	ERT	EARTH	EARTH	EARTH	EARTH
3	+	+	+	+	+	FIRST	FIRST	FIRST	FIRST	FIRST
4	+	+	+	+	+	+	+	+	+	+
5	+	+	+	+	+	HURT	HURT	+	HURT	HURT
6	+	+	SHERIT	CHARIT	CHARIT	N/R	HURTS	HURTS	HURTS	HURTS
7	CHARIT	SHARIT	SHARIT	SHARIT	SHARIT	FIRST	EARTH	EARTH	FIRST	FIRST
8	+	+	+	+	+	+	HURT	+	HURT	HURT
9	+	+	+	+	+	FUR	FUR	FUR	HER	FUR
10	+	+	+	+	+	HURT	ERT	HURT	HURT	ERP
11	+	+	+	+	+	FERN	FUR	FUR	FUR	FUR
12	+	+	+	+	+	HER	HERB	HERP	HERPS	HERPS
13	+	SHARIT	SHARIT	SHARIT	+	HURT	FIRST	FIRST	N/R	N/R
14	+	+	+	+	+	+	+	+	+	+
15	+	+	+	+	+	HER	HER	HER	HER	HER
16	+	CHERT	+	+	+	ERP	ERT	VERB	HERPST	ERCH
17	+	+	+	+	+	+	DIRT	FUR	FUR	FUR
18	+	+	+	+	+	+	+	+	+	+
19	+	+	+	+	+	EARTH	EARTH	EARTH	EARTH	EARTH
20	+	+	+	+	+	EARTH	+	+	BIRD	BIRD
21	+	+	+	+	+	FIRT	+	FIRST	FIRST	FIRST
22	+	+	+	+	+	HURT	BERT	BERT	HURT	+
23	+	+	+	+	+	N/R	HURT	+	+	+
24	+	+	+	+	JERT	+	+	CHIRT	CHURCH	CHURCH
25	+	+	+	+	+	HER	HER	HER	HER	HER
26	+	+	+	+	+	HURT	HURT	HURT	HURT	HURT
27	+	+	SLUR	SHIT	+	BURP	ERP	ERP	ERP	SERP
28	+	+	+	+	+	+	+	+	+	+
29	+	+	+	+	+	HURT	HURT	HURT	HURT	HURT
30	+	+	+	+	+	HURT	HURT	HURT	HURT	HURT
31	+	+	+	+	+	HURT	HURT	HER	BURP	HURT
32	+	+	+	+	+	N/R	HURT	HER	BERT	VER

NUMBER										
CORRECT:	31	29	28	28	29	7	7	8	5	6

# Appendix E

Subject Responses for the Speech Synthesized Word "Hearc" in the Single Word Conditions.

SUBJECT	VOIRAX PRESENTATION NUMBER					ECHO PRESENTATION NUMBER				
	1	2	3	4	5	1	2	3	4	5
1	SHIRT	JURY	SHIRT	SHIRT	SHIRT	FUR	ERP	PERFECT	PERFECT	PERFECT
2	ERT	JERD	TURN	ERD	ERD	ERT	EARTH	ERT	EARTH	EARTH
3	GIRL	GIRL	GIRL	GIRL	GIRL	BIRD	GIRL	FIRST	FUR	FIRST
4	SHIRT	N/R	SHIRT	SHIRT	SHIRT	N/R	N/R	N/R	N/R	N/R
5	BIRD	BIRD	+	+	SHIRT	BIRD	HERB	+	+	+
6	N/R	JERRY	CARRY	CARRY	CARRY	N/R	HURRY	N/R	HURRY	HURRY
7	N/R	CHERRY	CHARITY	CHARITY	CHARITY	HURRY	HURRY	HURRY	HURRY	HURRY
8	+	+	+	+	+	PERK	BERG	BERG	PERK	PERK
9	THIRD	CHARITY	CHARITY	CHARITY	CHARITY	FUR	HURRY	HURRY	HURRY	HURRY
10	SHERD	CHARITY	CHARITY	CHARITY	CHARITY	HURT	HURT	BURGANDY	BURGIN	N/R
11	CARRY	CARRY	CARRY	CARRY	CARRY	FERN	FUR	FERN	FERN	FUR
12	+	CHARITY	THIRD	THIRD	THIRD	PERFECT	PERFECT	PERFECT	PERFECT	PERFECT
13	CARROT	CARROT	CARROT	CARROT	CARROT	FERN	N/R	N/R	N/R	N/R
14	SHIRT	SHIRT	SHIRT	CURD	SHIRT	N/R	PURGE	PURGE	PURGE	PERP
15	SHIRT	SURE	SHIRT	SHIRT	SHIRT	+	PERFECT	PERFECT	PERFECT	PERFECT
16	SHIRT	DERJIT	CHERD	JERD	JERJ	HERP	HERP	ERP	ERP	HERP
17	CURVE	CHARITY	CHARITY	CHARITY	CHARITY	FUR	THERAPY	THERAPY	THERAPY	THERAPY
18	FIRST	CARRY	JURY	SHIRT	SHIRT	HER	FIRST	HURT	FIRST	HURT
19	BIRD	BIRD	BIRD	BIRD	BIRD	BURP	ERD	BIRD	BIRD	BIRD
20	BIRD	TURN	TURN	SHIRT	TURN	BIRD	BIRD	BIRD	BIRD	BIRD
21	SHIRT	N/R	SHIRT	SHIRT	SHIRT	PERF	ERP	FIRT	FIRT	FIRG
22	GURD	GURD	N/R	CURD	GURD	ERG	ERG	ERG	BERG	BERG
23	SHIRT	SHIRT	SHIRT	SHIRT	SHIRT	FUR	HURT	FUR	HER	HER
24	DER	JURY	JURY	JURY	JURY	ERD	EREE	EREE	HURRY	EREE
25	+	+	+	+	+	PERFECT	PERFECT	PERFECT	PERFECT	PERFECT
26	BIRD	BIRD	BIRD	BIRD	BIRD	BIRD	BIRD	BIRD	BIRD	BIRD
27	ERD	ERP	ERD	ERD	UGG	ER	ERP	ERP	BURP	ERP
28	THIRD	SHIRT	THIRD	CURD	N/R	PERFECT	BIRD	PERFECT	PERFECT	PERFECT
29	+	N/R	N/R	N/R	N/R	BURP	N/R	N/R	N/R	BERG
30	DIRT	DIRT	THIRD	THIRD	THIRD	FUR	THIRD	THIRD	HURT	HURT
31	SHIRT	CHERRY	CARROT	CARROT	CARROT	HER	HURRY	HURRY	HURRY	HURRY
32	+	+	+	+	CURD	PERFECT	PERFECT	PERFECT	PERFECT	PERFECT

NUMBER

CORRECT: 5 3 4 4 2 1 0 1 1 1

# Appendix E

Subject Responses for the Speech Synthesized Word "Notch" in the Single Word Conditions.

SUBJECT	VOTRAX PRESENTATION NUMBER					ECHO PRESENTATION NUMBER				
	1	2	3	4	5	1	2	3	4	5
1	WATCH	WATCH	WATCH	WATCH	WATCH	MUCH	MUCH	MUCH	MUCH	MUCH
2	BLOTCH	BLOTCH	BLOTCH	BLOTCH	BLOTCH	MA	MA	MA	MA	MA
3	BLOTCH	BLOTCH	BLOTCH	BLOTCH	BLOTCH	MARCH	MARCH	MARCH	MARCH	MARCH
4	WATCH	WATCH	WATCH	WATCH	WATCH	MUCH	MUCH	MUCH	MUCH	MUCH
5	BLOTCH	BLOTCH	BLOTCH	LOTCH	BLOTCH	MUCH	+	+	+	+
6	LOTCH	LOTCH	LOTCH	+	LOTCH	MARCH	+	MOTCH	MOTCH	MOTCH
7	+	BLOTCH	BLOTCH	BLOTCH	+	MATCH	MATCH	MUCH	MUCH	MUCH
8	BLOTCH	BLOTCH	BLOTCH	BLOTCH	BLOTCH	MUCH	MUCH	MUCH	MUCH	MUCH
9	BLOTCH	BLOTCH	BLOTCH	BLOTCH	BLOTCH	MOP	MOP	MOP	MOP	MOP
10	BLOTCH	BLOTCH	BLOTCH	BLOTCH	BLOTCH	MARCH	MARCH	MARCH	MARCH	MARCH
11	LODGE	LODGE	LODGE	LODGE	LODGE	MALT	MALK	MAWLCH	MAWLCH	MAWLCH
12	BOTCH	LOTCH	LOTCH	LOTCH	WATCH	MARCH	MARCH	MOTCH	MOTCH	MOTCH
13	LOT	BLOT	BLOT	NOT	BLOT	MARCH	MARCH	MARCH	MARCH	MARCH
14	LOTCH	LOTCH	LOTCH	LOTCH	BLOTCH	+	+	+	+	+
15	LOT	LOT	LOT	BLUT	LOT	MY	MY	MY	MARK	MOP
16	BLOTCH	BLOTCH	BLOTCH	BLOTCH	BLOTCH	MA	MAWCH	MAWCH	MAWCH	MAWCH
17	NOT	NOT	NOT	NOT	NOT	MARCH	MARCH	MARCH	MARCH	MUCH
18	WATCH	BLOTCH	BLOTCH	BLOTCH	LODGE	MUCH	MUCH	MUCH	MUCH	MUCH
19	BLOCK	MUCH	MUCH	MUCH	WATCH	MUCH	MUCH	MUCH	MUCH	MUCH
20	WATCH	WATCH	WATCH	WATCH	WATCH	MOTH	MOY	MOTH	MONTH	MOTH
21	BLOT	BLOT	BLOT	BLOT	BLOT	MUCH	MUCH	MUCH	MUCH	MUCH
22	BLOTCH	BLOTCH	BLOTCH	BLOTCH	BLOTCH	MUCH	MUCH	MUCH	MUCH	MUCH
23	LOT	LOT	LOT	LOT	LOT	MUCH	MUCH	LOT	LOT	NOT
24	BLOTCH	LARCH	LOTCH	LOTCH	LOTCH	MOTCH	MOTCH	MOTCH	MOTCH	MOTCH
25	BLOCK	LOT	BLOT	BLOTCH	BLOTCH	N/R	MAN	MUM	MARCH	MARCH
26	LOOKED	LOOKED	LOOKED	KNOCKED	KNOCKED	LUNCH	MUCH	MUCH	MUCH	MUCH
27	BLOTCH	BLOTCH	BLOTCH	LOTCH	LOTCH	MOTCH	MOTCH	MOTCH	MUTS	MUCH
28	BLOTCH	BLOTCH	LODGE	BLOTCH	BLOTCH	NOT	+	+	+	+
29	BLOTCH	BLOTCH	BLOTCH	BLOTCH	BLOTCH	MARCH	MARCH	MARCH	MARCH	MARCH
30	BLOCK	BLOTCH	MARCH	BLOTCH	BLOTCH	MARCH	MARCH	MARCH	MARCH	MARCH
31	BLOT	BLOT	BLOT	BLOT	BLOT	MARCH	MUCH	MUCH	MUCH	MUCH
32	WATCH	WATCH	WATCH	BLUTCH	LUTCH	MOCK	MA	MA	MA	NOT
NUMBER										
CORRECT:	1	0	0	1	1	1	4	3	3	3

# Appendix E

Subject Responses for the Speech Synthesized Word "Walk" in the Single Word Conditions.

SUBJECT	VOTRAX PRESENTATION NUMBER					ECHO PRESENTATION NUMBER				
	1	2	3	4	5	1	2	3	4	5
1	BLOCK	BLOCK	BLOCK	BLOCK	BLOCK	WOLF	WOLF	WOLF	WOLF	+
2	LA	LA	BLOCK	BLOCK	BLOCK	WOLF	WOLF	WOLF	WOLF	WOLF
3	BLOT	BLOT	BLOT	BLOT	BLOT	+	WOLF	+	+	WARMTH
4	BLOCK	BLOCK	BLOCK	BLOCK	BLOCK	WOLF	WOLF	N/R	WAWLF	WALL
5	BLOCK	BLOCK	BLOCK	BLOCK	BLOCK	+	MORE	LOOK	WONG	LOOK
6	BLOCK	LOCK	LOCK	LOCK	LOCK	N/R	N/R	N/R	WA	WATH
7	BLOCK	BLOCK	LOCK	BLOCK	LOCK	LOFT	LOFT	LOFT	LOFT	LOFT
8	BLOCK	BLOCK	BLOCK	BLOCK	BLOCK	+	WOLF	+	+	+
9	BLAH	BLOCK	BLOCK	BLOB	BLOB	HOLE	LOW	LOW	LOW	LOLL
10	BLOCK	BLOCK	BLOCK	BLOCK	BLOCK	WOOL	WOOL	+	WALL	+
11	LIE	LIE	LIE	LIE	FLY	MALT	MALL	MALT	MALT	MULL
12	BLOCK	BLOCK	BLOCK	LOCK	BLOCK	LOW	LOAF	LOOK	LOOK	LOOK
13	BLOCK	BLOCK	BLOT	BLOT	LOCK	MORE	MORE	MORE	MORE	MORK
14	BLOT	BLOT	BLOT	BLOT	BLOT	+	+	+	+	+
15	LOCK	BLAH	LOT	LOCK	BLOCK	WALL	WALL	WALL	+	+
16	BLOCK	BLOCK	BLOTCH	BLOCK	BLOCK	MO	MO	MO	MO	MAW
17	BLOCK	BLOCK	BLOCK	BLOCK	BLOCK	WALL	WALL	WALL	WALL	WALL
18	BLOCK	LOCK	+	BLOCK	BLOCK	+	WOKE	+	+	+
19	WALL	BLOCK	BLOCK	BLOCK	BLOCK	LOVE	LOVE	LOVE	LOVE	LOVE
20	MDM	+	WATCH	+	+	+	N/R	+	+	+
21	BLOB	BLOCK	BLOT	BLOT	BLOT	LOAF	LOAF	LOAF	LOAF	LOAF
22	BLAH	BLOCK	BLOCK	BLOCK	BLOCK	WOLF	WOLF	+	+	+
23	LOT	LOT	LOT	LOT	LOT	ONE	+	+	+	+
24	BLAH	BLAH	LA	LA	LA	+	WA	MA	MAW	+
25	BLAH	BLOCK	BLOCK	BLOCK	BLOCK	WALL	WALL	WALL	WALL	WALL
26	BLOT	BLOCK	BLOCKED	BLOCKED	BLOCK	WOLF	WOLF	WOLF	WOLF	+
27	AWK	BLOCK	BLOCK	UK	LOOK	+	MOOF	LOOK	MAWK	LOOK
28	BLAH	BLOCK	BLOCK	BLOCK	BLOCK	WOLF	LOW	LOOK	LOG	LOOK
29	BLOT	BLOT	BLOT	BLOT	BLOT	+	WALL	WOKE	+	WOKE
30	BLOCK	BLOCK	BLOCK	BLOCK	BLOCK	LOOK	LOOK	LOOK	LOOK	LOOK
31	BLOB	BLOCK	BLOT	BLOCK	BLOT	WALL	WOLF	WOLF	+	WOLF
32	BLOCK	BLOCK	BLOCK	LOCK	BLOCK	+	+	+	+	+
NUMBER CORRECT:	0	1	1	1	1	10	3	9	11	12



# Appendix E

Subject Responses for the Speech Synthesized Word "Wall" in the Single Word Conditions.

SUBJECT	VOTRAX PRESENTATION NUMBER					ECHO PRESENTATION NUMBER				
	1	2	3	4	5	1	2	3	4	5
1	FALL	BALL	+	+	+	WOMB	LOOM	LOOM	ONE	ONE
2	LALL	LALL	LALL	LALL	LALL	ONE	+	+	+	+
3	+	+	+	+	+	WARM	WARM	WARM	WARM	WARM
4	BALL	BALL	BALL	BALL	BALL	ONE	+	+	+	+
5	+	BLALL	BLALL	BLALL	BLALL	WARM	LONG	WARM	WARM	LONG
6	N/R	LAU	LAU	+	BLALL	ONE	ONE	ONE	ONE	ONE
7	BLOUSE	BLALL	BLALL	BLULL	BLULL	LUM	GLUM	GLUM	GLUM	GLUM
8	+	+	+	+	BALL	HOM	WORN	ONE	WOMB	WORN
9	LALL	LALL	BLALL	BLALL	BLALL	ONE	LULL	LULL	LULL	LULL
10	BALL	BALL	BALL	BALL	BALL	ONE	+	+	+	+
11	LULL	BALL	LULL	LULL	LULL	MOM	MALL	MOM	MOM	MOM
12	BLALL	BLALL	BLALL	BLALL	BLALL	MOM	ONE	ONE	LUN	LUN
13	N/R	BALL	N/R	LULL	N/R	WOMB	WOMB	WOMB	WOMB	WOMB
14	N/R	BLALL	LAW	BLALL	BLAW	WUM	+	+	WUM	+
15	LULL	+	LULL	UL	+	+	WOOL	+	+	+
16	BLALL	BLALL	BLULL	BLAEL	BLALL	MOUM	MOUM	MOUM	MAWM	MAWM
17	DOLL	BALL	DOLL	BALL	DULL	WOMB	ONE	WOMAN	WOMAN	ONE
18	FALL	FALL	BLALL	BLALL	LALL	ONE	ONE	ONE	ONE	ONE
19	+	+	+	+	+	+	+	+	+	+
20	+	BALL	+	+	+	WOMB	WOMB	WOMB	WOMB	WOMB
21	BLALL	BLALL	BLALL	BLALL	BLALL	LUG	LULL	LULL	LULL	BLALL
22	BALL	+	BALL	BLALL	BLALL	+	+	+	+	+
23	WOW	LAUW	LAUW	LAUW	LAUW	ONE	ONE	ONE	ONE	ONE
24	BLULL	BLALL	BLALL	BLALL	BLALL	+	+	+	+	+
25	BLAH	LALL	BLULL	LULL	LULL	ONE	+	+	ONE	ONE
26	BLAH	LALL	LALL	LALL	LALL	LULL	LULL	LULL	RUN	RUN
27	BALL	ULL	BA	BUL	BLUL	WUM	LULL	BUL	BUL	WUB
28	BALL	BALL	BALL	BALL	BALL	ONE	LULL	LULL	ONE	ONE
29	BALL	BALL	BALL	BALL	BALL	N/R	WARM	WARM	WARM	WARM
30	BALL	BALL	BALL	BALL	BALL	WUM	ONE	ONE	ONE	ONE
31	BOTTLE	BOTTLE	BLOT	BOTTLE	BOTTLE	WARM	WARM	WARM	+	ONE
32	BALL	BALL	BALL	BALL	BALL	ONE	LAWN	LAWN	LAWN	LAWN
NUMBER CORRECT:	5	5	5	6	5	4	8	9	8	8



# Appendix E

Subject Responses for the Speech Synthesized Word "Moon" in the Single Word Conditions.

SUBJECT	VOTRAX PRESENTATION NUMBER					ECHO PRESENTATION NUMBER				
	1	2	3	4	5	1	2	3	4	5
1	+	+	+	+	+	ROOM	ROOM	ROOM	LOOM	ROOM
2	N/R	DOON	DOON	DOON	DOON	LOON	LOON	LOON	LOON	LOON
3	+	+	+	+	+	+	+	+	+	+
4	+	+	+	+	+	+	+	NOON	NOON	NOON
5	+	+	+	BALLOON	BALLOON	BLUE	LOON	LOON	LOON	BALLOON
6	+	+	+	+	NOON	NOON	NOON	LOON	NOON	NOON
7	BALLOON	BALLOON	BALLOON	BALLOON	BALLOON	NOON	NOON	NOON	NOON	NOON
8	ROOM	ROOM	+	+	+	LOOM	ROOM	LOOM	LOOM	LOOM
9	BALLOON	BLOOM	BLOOM	BLOOM	BLOOM	LOOM	LOOM	LOOM	LOOM	LOOM
10	BALLOON	BALLOON	BALLOON	BALLOON	BALLOON	BALLOON	BALLOON	BALLOON	BALLOON	BALLOON
11	+	+	+	+	+	+	LOON	LOON	LOON	LOON
12	+	+	+	+	+	NOON	NOON	NOON	NOON	NOON
13	+	+	+	+	+	LOON	+	LOON	+	LOOM
14	BLOON	BLOOM	BLOOM	BLOOM	BLOOM	LOON	ROOM	LOON	LOOM	LOON
15	+	+	+	+	N/R	+	+	LOON	LOON	LOON
16	BLOOM	BLOOM	BOOM	BLOOM	BLOOM	BLOOM	NOOM	NOOM	NOOM	BLOOM
17	+	+	+	+	+	NOON	NOON	NOON	NOON	NOON
18	+	+	+	BLOOM	BLOOM	LOOM	LOOM	LOOM	LOOM	BLOOM
19	+	+	+	+	+	+	+	+	+	NEW
20	+	+	+	+	+	+	ROOM	ROOM	ROOM	ROOM
21	BLOOM	BLOOM	BLOOM	BLOOM	BLOOM	NOON	NOON	NOON	NOON	NOON
22	+	+	+	BALLOON	+	BLOOM	BLUE	LOON	LOON	LOON
23	+	+	+	+	+	LOON	LOON	LOON	LOON	LOON
24	+	+	+	+	+	LOON	LOON	LOON	LOON	LOON
25	+	+	+	+	+	LOON	LOON	LOON	LOOM	LOON
26	+	+	+	+	+	LOON	LOON	LOON	LOON	LOON
27	LU	GLOOM	LOOM	LOOM	LOOM	LOOM	BLOOM	LOOM	BLOOM	LOOM
28	+	+	+	BALLOON	BALLOON	LOON	LOON	LOON	LOON	LOON
29	+	+	+	+	+	NOON	NOON	NOON	NOON	NOON
30	+	+	BALLOON	BALLOON	BALLOON	BALLOON	BALLOON	BALLOON	BALLOON	BALLOON
31	BALLOON	BALLOON	+	BOOM	+	BALLOON	NOON	NOON	NOON	NOON
32	+	+	+	+	+	+	+	+	+	+
NUMBER CORRECT:	22	22	23	18	18	7	6	3	4	2

# Appendix E

Subject Responses for the Speech Synthesized Word "Jews" in the Single Word Conditions.

SUBJECT	VOTRAX PRESENTATION NUMBER					ECHO PRESENTATION NUMBER				
	1	2	3	4	5	1	2	3	4	5
1	JEWELS	JEWELS	JEWELS	JEWELS	JEWELS	TUMORS	JUMAS	JUMIS	TUMORS	JUMAS
2	JUICE	JUICE	+	JUICE	+	JUICE	JUICE	+	+	+
3	JEWELS	JEWELS	JEWELS	JEWELS	JEWELS	JEWELS	JEWELS	JEWELS	CHOOSE	JEWELS
4	JUICE	JUICE	JUICE	JUICE	JUICE	JUICE	JUICE	JUICE	JUICE	JUICE
5	SHOES	SHOES	SHOES	SHOES	SHOES	JUICE	SHOES	SHOES	CHOOSE	CHOOSE
6	JUICE	+	+	+	+	JUICE	JUICE	+	+	JUICE
7	JEWELS	JEWELS	JEWELS	JEWELS	JEWELS	JULIUS	JULIUS	JULIUS	JULIUS	JULIUS
8	+	+	+	+	+	JUDAS	JUDAS	JUDAS	JUDAS	JUDAS
9	JUNE	+	+	+	+	JUICE	JUICE	+	+	+
10	JEWELS	JEWELS	JEWELS	JEWELS	JEWELS	JULIS	JEWELS	JEWELS	JEWELS	JEWELS
11	+	JEWELS	JEWELS	JEWELS	JEWELS	N/R	JEWELS	JEWELS	JEWELS	JEWELS
12	JEWELS	JEWELS	JEWELS	JEWELS	JEWELS	JUICE	JULIUS	JULIUS	JULIUS	JULIUS
13	CHOOSE	CHOOSE	CHOOSE	+	+	GERMANS	GERMANS	CHOOSE	CHOOSE	GERMANS
14	JEWELS	JEWELS	JEWELS	JEWELS	JEWELS	JEWELS	JEWELS	JULIE'S	JULIE'S	JULIE'S
15	CHOOSE	+	+	+	CHOOSE	JULIE'S	+	+	+	+
16	+	+	+	+	+	JULIUS	JEWELSH	JEWELS	JEWELS	JEWELS
17	JEWELS	JEWELS	JEWELS	JEWELS	JEWELS	JUNE	JUNE	JEWELS	JUICE	JUICE
18	+	+	+	JEWELS	JEWELS	JEWELUS	+	+	+	CHOOSE
19	JUNE	JUNE	JUNE	JUNE	JUNE	JUICE	JUICE	JUICE	JUICE	JUICE
20	JUNE	JUNE	JEWELS	JEWELS	JEWELS	JUNES	JUNE	JEWELS	+	JEWELS
21	+	JUNE	JUNE	+	JEWELS	JUDAS	JUDAS	JUDAS	JUDAS	JUDAS
22	+	JEWELS	+	JEWELS	JEWELS	JEWELUS	JEWELUS	JUDAS	JUDAS	JEWELUS
23	+	+	+	+	+	N/R	N/R	+	+	CHOOSE
24	+	+	+	+	+	JEWELUS	JUICE	+	+	JUICE
25	JEWELS	JEWELS	JEWELS	JEWELS	JEWELS	JULIUS	JULIUS	JULIUS	JULIUS	JULIUS
26	JEWELS	JEWELS	JEWELS	JEWELS	JEWELS	JUICE	JUICE	JUICE	JUICE	JUICE
27	JUICE	JUICE	JUICE	JUICE	JUICE	JUICE	JUICE	JUICE	JUICE	JUICE
28	JEWELS	JEWELS	JEWELS	JEWELS	JEWELS	JUICE	JUICE	JUICE	JEWELS	JEWELS
29	+	+	+	+	+	JUICE	+	+	+	+
30	+	+	+	+	JUICE	JULY	+	JUICE	JUICE	JUICE
31	JUICE	JEWELS	JUICE	JUICE	JUICE	JEWELS	JUICE	JUICE	JUICE	JEWELS
32	JUNE	JUNE	JUNE	JUNE	JUNE	JULIUS	JULIUS	JULIE'S	JULIE'S	JULIE'S
NUMBER CORRECT:	10	10	12	11	9	0	4	8	9	4

# Appendix E

Subject Responses for the Speech Synthesized Word "Sing" in the Single Word Conditions.

SUBJECT	VOYTRAX PRESENTATION NUMBER					ECHO PRESENTATION NUMBER				
	1	2	3	4	5	1	2	3	4	5
1	SIN	SIN	SIN	SIN	SIN	THIN	SIM	SOOM	SIM	SOOM
2	SIN	ZIN	ZIN	SIN	SIN	ZIN	BIN	IN	ZIN	IN
3	SIN	SIN	SIN	SIN	SIN	WOMEN	SIN	WOMEN	SIN	SIN
4	SIN	SIN	SIN	SIN	SIN	SIN	SINNED	SIN	SIN	SIN
5	TEN	SIN	SIN	SIN	SIN	HIM	HIM	HIM	HIM	HIM
6	N/R	ZIN	ZIN	ZIN	SIN	SIN	SIN	ZIM	SIN	SIM
7	SIN	SIN	SIN	SIN	SIN	SIN	SIN	SIN	SIN	SIN
8	SEND	SIN	SIN	SIN	SIN	SIN	SIN	SIN	+	SIN
9	SIN	SIN	SIN	SIN	SIN	THIN	THIN	THIN	THIN	THIN
10	SELL	SALE	SELL	SELL	SELL	BIM	BIM	BIM	BIM	BIM
11	SIN	SALE	SALE	SELL	SALE	FUME	FUME	FUME	FUME	FUME
12	SIN	ZIN	ZIN	SIN	ZIN	ZIN	ZIN	ZIM	ZIM	ZIM
13	SIN	SIN	SIN	SIN	SIN	SWIM	SWIM	SWIM	SWIM	SWIM
14	SIN	SIN	SILL	SILL	SILL	SIM	SIM	SIM	SIM	SIM
15	N/R	SANG	+	+	+	HIM	HIM	BIM	HIM	HIM
16	TAILER	SALE	SALE	SALE	SALE	FIM	IM	FIM	FIM	IMP
17	TEN	TEN	TEN	TIN	TIN	THIN	THIN	THIN	THIN	THIN
18	SIN	SIN	SIN	SIN	SIN	SIN	SIN	SIN	SIN	SIN
19	SIN	SIN	SIN	SIN	SIN	SIN	SIN	SIN	SIN	SIN
20	SIN	SIN	SIN	SIN	SIN	ROOM	GROOM	ROOM	SWIM	SWIM
21	SIN	SIN	SIN	SIN	SIN	SIN	SIN	SIN	SIN	SIN
22	SILL	SILL	SILL	SILL	SILL	SIM	SIM	SIM	SIM	SIM
23	SIN	SIN	SIN	SIN	SIN	SIN	SIN	SIN	SIN	SIN
24	SELL	ZAIL	ZELL	ZELL	ZELL	IM	IM	IM	IM	IM
25	SIN	SIN	SIN	SIN	SIN	SIN	SIN	SIN	SIN	SIN
26	SIN	SIN	SIN	SIN	SIN	SIN	SIN	SIN	SIN	SIN
27	SELL	ZELL	ZILL	NILL	SILL	SIM	SIM	SIM	SIM	SIM
28	SIN	SIN	SIN	SIN	SIN	SIN	SIN	SIN	SIN	SIN
29	SIN	SIN	SIN	SIN	SIN	SIN	SIN	SIN	SIN	SIN
30	SAND	SIN	SIN	SIN	SIN	SIN	SIN	SIN	SIN	SIN
31	SIN	SIN	SIN	SIN	SIN	HIM	HIM	HIM	HIM	HIM
32	SIN	SIN	SIN	SIN	SIN	SIM	IN	SIM	SIM	SIM
NUMBER										
CORRECT:	0	0	1	1	1	0	0	0	1	0

# Appendix E

Subject Responses for the Speech Synthesized Word "Thin" in the Single Word Conditions.

SUBJECT	VOTRAX PRESENTATION NUMBER					ECHO PRESENTATION NUMBER				
	1	2	3	4	5	1	2	3	4	5
1	SIN	SIN	SIN	SIN	SIM	SIM	+	+	SIM	+
2	SIN	SIN	ZIN	ZIN	ZIN	IN	IN	IN	BIN	IN
3	SIN	SIN	SIN	SIN	SIN	WOMEN	WOMEN	WOMEN	WOMEN	WOMEN
4	SIN	SIN	SIN	SIN	SIN	SIN	N/R	SIN	SIN	SIN
5	TEN	TEN	SIN	SIN	SIN	HIM	HIM	HIM	HIM	HIM
6	ZIN	SIN	SIN	ZIN	SIN	IN	IN	IN	IN	IN
7	SIN	SIN	SIN	SIN	SIN	+	+	+	+	+
8	SIN	SIN	SIN	SIN	SIN	HIM	HIM	+	+	+
9	SIN	SIN	+	SIN	+	+	+	+	+	+
10	SELL	SELL	SELL	SELL	SELL	BIM	BIM	BIM	BIM	BIM
11	SALE	SALE	SALE	SELL	FELL	N/R	FUME	FUME	FUME	FUME
12	ZIN	ZIN	ZIN	ZIN	ZIN	+	+	+	ZIN	+
13	SIN	SIN	SIN	SIN	SIN	SWIM	SWIM	SWIM	SWIM	SWIM
14	SIN	SIN	SILL	SILL	SILL	FIM	SIN	SIM	SIM	SIM
15	SING	SING	SING	SIN	SING	BIM	HIM	DIM	HIM	HIM
16	ZALE	SALE	SALE	ZALE	ZALE	FIM	HIM	IM	FIM	FIM
17	TIN	+	TIN	TEN	TIN	+	+	+	+	+
18	SIN	SIN	SIN	SIN	SIN	HIM	SIN	SIN	SIN	SIN
19	SIN	SIN	SIN	SIN	SIN	SIN	SIN	SIN	SIN	SIN
20	SIN	SIN	SIN	SIN	SIN	SWIM	ROOM	ROOM	ROOM	ROOM
21	SIN	SIN	SIN	SIN	SIN	+	+	+	+	+
22	SILL	SILL	SILL	SILL	SILL	DIM	BIM	BIM	SWIM	BIM
23	SIN	SIN	SIN	SIN	SIN	SIN	+	+	SIN	+
24	ZELL	ZAIL	ZELL	ZELL	ZELL	IM	IM	IM	IM	IM
25	SIN	SIN	SIN	SIN	SIN	SIN	SIN	+	+	+
26	SIN	SIN	SIN	SIN	SIN	+	+	+	+	+
27	I	THIV	SILL	MILL	NI	BIM	IM	SPIM	IM	IM
28	SIN	SIN	SIN	SIN	SIN	+	+	+	+	+
29	SIN	SIN	SIN	SIN	SIN	+	+	+	SIN	FIN
30	SIN	SIN	SIN	SIN	SIN	SIN	SIN	SIN	SIN	SIN
31	SIN	SIN	SIN	SIN	SIN	HIM	HIM	HIM	HIM	HIM
32	SIN	SIN	SIN	SIN	SIN	FIM	FIM	FIM	FIM	FIM
NUMBER CORRECT:	0	1	1	0	1	8	10	12	8	12

# Appendix E

Subject Responses for the Speech Synthesized Word "Wrath" in the Single Word Conditions.

SUBJECT	VOTRAX PRESENTATION NUMBER					ECHO PRESENTATION NUMBER				
	1	2	3	4	5	1	2	3	4	5
1	RAT	RASP	RAZ	REST	RATS	REST	MASK	MESS	MESS	MESS
2	AT	RAT	RAT	RAT	RAT	LESS	LESS	LESS	LESS	LESS
3	DRESS	DRESS	DRESS	DRESS	DRESS	MISS	MASS	MASS	MASS	MASS
4	N/R	N/R	DRESS	DRESS	DRESS	MESS	MESS	MASS	MASS	MASS
5	DRESS	DRESS	PRESS	DRESS	DRESS	MESS	MESS	RESS	RESS	MESS
6	N/R	RASS	RASS	RASS	RESS	N/R	+	MATH	MATH	+
7	REST	RASS	RASS	DRESS	RASS	MASK	MASK	MASK	MASK	MASK
8	REST	REST	RESS	REST	REST	REST	REST	REST	REST	REST
9	GLASS	HARASS	HARASS	HARASS	HARASS	RAT	RAT	MAT	RAT	RAT
10	RASS	RAZ	DRESS	RASP	BRASS	RASS	RASS	REST	RASP	RASP
11	GLASS	GLASS	GLASS	GLASS	GLASS	MATH	MATH	MATH	MATH	MATH
12	BRASS	BRASS	BRASS	BRASS	BRASS	MATH	MATH	MATH	MATH	MATH
13	RAT	RAT	RAT	RAT	RAT	MASK	MASK	MASK	MASK	MASK
14	BRASS	BRASS	BRASS	DRESS	DRESS	REST	RASS	REST	RESS	REST
15	REST	REST	REST	REST	REST	MASS	MESS	MESS	MESS	MESS
16	BRASS	RASS	RASS	RASS	BRASS	ME	MERF	MERF	MERF	MERF
17	GIRAFFE	DRESS	DRESS	DRESS	DRESS	RAFT	+	RAFT	RAFT	RAFT
18	FAST	DRESS	DRESS	REST	REST	REST	REST	REST	REST	REST
19	REST	REST	REST	REST	REST	MESS	NEST	MESS	MESS	NEST
20	DRESS	DRESS	DRESS	DRESS	DRESS	N/R	N/R	NURSE	NURSE	MER
21	DRESS	DRESS	BLESS	LESS	LESS	MESS	MESS	MESS	MISS	MESS
22	BRASS	RASS	RASS	GRASS	GRASS	MASS	MATH	MATH	MATH	MATH
23	N/R	LESS	N/R	N/R	RATS	LESS	LESS	LESS	LESS	LESS
24	RESS	RESS	RESS	DRESS	DRESS	MATCH	MATCH	MATCH	MA	MA
25	REST	REST	REST	REST	REST	MESS	MESS	MESS	MESS	MESS
26	GRASS	BRASS	BRASS	GRASP	GRASP	RAFT	MATH	MATH	MATH	MATH
27	LA	GLESS	GLESS	GLESS	GLESS	MESS	MUSS	MESS	MUSS	MUSS
28	RAZ	RAZ	RAZ	GRASS	BRASS	MAN	MAT	MAT	MAT	MAT
29	REST	REST	REST	REST	REST	MESS	MESS	MESS	MESS	MESS
30	BLAST	GRASS	GRASS	GLASS	GLASS	MASK	MASK	MASK	MASK	MASK
31	DRESS	DRESS	DRESS	DRESS	DRESS	MERT	MESS	MESS	REST	MESS
32	N/R	RESS	RESS	RASS	BRASS	LET	MACK	MAT	MAT	MAT

NUMBER										
CORRECT:	0	0	0	0	0	0	2	0	0	1

# Appendix E

Subject Responses for the Speech Synthesized Word "Bat" in the Single Word Conditions.

SUBJECT	VOTRAX PRESENTATION NUMBER					ECHO PRESENTATION NUMBER				
	1	2	3	4	5	1	2	3	4	5
1	RAT	+	+	+	+	LAPS	MAP	MAPS	MAPS	MAPS
2	THAT	THAT	+	THAT	THAT	MAT	MAT	MAT	LAT	LAT
3	THAT	THAT	THAT	LET	THAT	MAPS	MASS	MAPS	MAPS	MASS
4	+	+	+	+	+	MATCH	MATCH	MATCH	MATCH	MATCH
5	BET	BET	BET	BET	BET	MET	MAT	MET	MET	MET
6	THAT	THAT	THAT	THAT	THAT	MASS	MAPS	MAPS	MAPS	MAPS
7	THATS	THATS	+	BET	BET	MATCH	MATCH	MATCH	MATCH	MATCH
8	+	RED	BET	BET	BET	MAT	MAT	MATCH	MAT	MAT
9	FAT	BLAT	BLAT	BLAT	BLAT	MAT	MAP	MAP	MAT	MAP
10	RED	N/R	BLAT	BED	THAT	MATCH	MAT	MATCH	MATCH	MATCH
11	+	+	+	+	+	MAT	MAT	MAT	MAT	MAT
12	THAT	THAT	+	THAT	THAT	MATCH	MATCH	MATH	MATH	MATCH
13	+	+	+	THAT	THAT	MAP	MAPS	MAPS	MAPS	MAPS
14	THAT	THAT	THAT	+	THAT	MAPS	MAPS	MAPS	MAPS	MAPS
15	BET	BET	BED	+	+	MAP	MAP	MAP	MAP	MA
16	BLAT	BLAT	+	BLAT	BLAT	MERT	ME	MER	MUCH	MET
17	MAT	DRAT	THAT	THAT	THAT	MATCH	MAT	MATCH	MAT	MATCH
18	+	+	+	BET	BET	MATCH	MATCH	MATCH	MATCH	MATCH
19	BED	BED	BED	WET	WET	MAPS	MAPS	MAPS	MAPS	MAPS
20	RED	DRESS	DRESS	DRESS	DRESS	MER	N/R	MER	MISS	MER
21	THAT	THAT	LET	bled	YET	MAPS	MAPS	MAPS	MAPS	MAPS
22	WET	BET	BET	BET	BET	MATCH	MATCH	MATCH	MATCH	MATCH
23	LET	LET	AT	LET	LET	LET	LET	MAT	LET	LET
24	BET	THAT	LET	BLET	BLAT	MATCH	MATCH	MATCH	MATCH	MATCH
25	THAT	LET	LET	LET	LET	MAP	MASK	MAN	MAN	MAP
26	BET	GLASS	GLASS	THAT	THAT	MAT	MAT	MAT	MAT	MAT
27	+	+	BET	BET	DEBT	MACK	ETS	MATCH	MAT	MAT
28	+	YET	+	BLAT	+	MAT	MAT	MAT	MAT	MAT
29	BED	BET	BED	BET	BET	MAT	MAT	MAT	MAT	MAT
30	THAT	THAT	THAT	THAT	THAT	MAT	MAT	MAT	MAT	MAT
31	THAT	THAT	THAT	THAT	GET	MARCH	MAP	MAPS	MAPS	MAPS
32	THAT	THAT	THAT	THAT	THAT	MACK	MAT	MAT	MAT	MAT

NUMBER

CORRECT: 7 6 10 5 5 0 0 0 0 0 0



# Appendix E

Subject Responses for the Speech Synthesized Word "Wife" in the Single Word Conditions.

SUBJECT	VOTRAX PRESENTATION NUMBER					ECHO PRESENTATION NUMBER				
	1	2	3	4	5	1	2	3	4	5
1	+	+	LICE	LICE	LIFE	+	+	+	+	+
2	LIFE	LIFE	LIFE	LIFE	LIFE	WOLF	LIFE	+	LIFE	+
3	LIFE	+	+	LIFE	LIFE	+	+	+	+	+
4	LIFE	LIFE	LIFE	N/R	LIFE	+	+	+	+	+
5	BLITH	BLICE	BLICE	BLICE	BLIF	+	+	+	+	+
6	LIFE	BLIFE	LIFE	LIFE	LIFE	+	+	+	+	+
7	LICE	SPLICE	SPLICE	BLICE	SPLICE	+	+	+	+	+
8	LIFE	LIFE	LIFE	LICE	LIFE	+	+	+	+	+
9	LIFE	LIFE	LIFE	BLITH	BLIFE	LIFE	LIFE	LIFE	LIFE	LIFE
10	LIFE	BLIFE	BLIFE	BLIFE	BLIFE	LIFE	LIFE	LIFE	LIFE	LIFE
11	LIES	LIES	LIES	LIES	LIES	+	+	+	+	+
12	LIFE	+	BLIFE	BLIFE	LIFE	+	+	+	LIFE	+
13	LIFE	BLITH	BLITH	BLITH	BLITH	+	+	+	+	+
14	BLITH	BLIFE	BLITH	BLIFE	BLIFE	+	+	+	+	+
15	LIFE	LIFE	LIFE	LIFE	BLIGHT	+	+	+	+	+
16	BLIKE	BLIKE	BLIKE	BLIKE	BLIKE	WOLE	WERF	WERF	WERLIP	WOLF
17	BLINDS	LIFE	BLINDS	LIFE	BLINDS	+	+	+	+	+
18	LIES	LIES	LIES	LIES	LIES	+	+	+	+	+
19	LIFE	LIFE	LIFE	LIFE	LIFE	LIFE	LIFE	LIFE	LIFE	LIFE
20	+	+	LIFE	+	+	WOMAN	+	+	+	MONTH
21	LIFE	BLIFE	BLITH	BLITH	LIFE	+	LIFE	+	LIFE	LIFE
22	LIES	BLICE	LIFE	BLIFE	BLIFE	+	+	+	+	+
23	LIFE	LIFE	LIFE	LIFE	LIFE	LIFE	LIFE	+	LIFE	LIFE
24	LICE	LICE	LICE	LICE	LICE	WI	+	+	WI	WI
25	LICE	LICE	LICE	LICE	LICE	+	+	+	+	+
26	LICE	LICE	LICE	LICEP	LICEP	+	+	+	+	+
27	LICE	LIFE	BLITHE	BLITHE	LITHE	LICE	LIFE	LIFE	LIFE	LIFE
28	LIFE	LIFE	LIFE	LIFE	LIFE	LIFE	LIFE	LIFE	LIFE	LIFE
29	LIFE	LICE	LICE	LICE	LICE	+	+	+	+	+
30	LICE	MICE	MICE	MICE	LIGHT	LICE	LICE	VICE	LICE	LIFE
31	LICE	BLIGHT	BLIGHT	SPLICE	BLIGHT	+	+	LIFE	+	+
32	LIFE	LIFE	LIFE	LIFE	LIFE	+	+	+	+	+
NUMBER CORRECT:	2	4	1	1	1	21	22	24	20	21

# Appendix E

Subject Responses for the Speech Synthesized Word "Night" in the Single Word Conditions.

SUBJECT	VOTRAX PRESENTATION NUMBER					ECHO PRESENTATION NUMBER				
	1	2	3	4	5	1	2	3	4	5
1	WHITE	WHITE	WHITE	LIGHT	LIGHT	LIGHTS	MICE	LIGHTS	LIGHTS	LIGHTS
2	LIGHT	LIGHT	LIGHT	LIGHT	LIGHT	MILK	MILK	LIFE	MIKE	MIKE
3	LIGHT	LIGHT	LIGHT	LIGHT	LIGHT	N/R	N/R	MIGHT	MIGHT	MIGHT
4	WHITE	WHITE	WHITE	WHITE	WHITE	N/R	MIGHT	MIGHT	MIGHT	MIGHT
5	LIGHT	LIGHT	LIGHT	BLIDE	BLIGHT	MIGHT	MIGHT	MIGHT	MIGHT	+
6	LIGHT	LIGHT	LIGHT	LIGHT	LIGHT	N/R	+	N/R	NIGHTS	NIGHTS
7	LIED	LIED	LIED	LIED	LIED	MIGHT	MIGHT	MIGHT	MIGHT	MIGHT
8	LIGHT	LIGHT	LIGHT	LIGHT	LIGHT	MIGHT	MIGHT	MIGHT	MIGHT	MIGHT
9	LIGHT	BLIGHT	LIGHT	BLIGHT	BLIGHT	MIGHT	MIGHT	LIGHT	+	MIGHT
10	MIGHT	BLIDE	BLIDE	BLIDE	BLIDE	MIGHT	MIGHT	MIGHT	MIGHT	MATE
11	LIGHT	LIGHT	LIGHT	LIGHT	LIGHT	MALT	MALT	MALT	MALT	MAWLOH
12	LIGHT	LIGHT	LIGHT	LIGHT	LIGHT	ME	ME	MIGHT	MIGHT	MIGHT
13	LIGHT	LIGHT	LIGHT	LIGHT	LIGHT	MIGHT	MIGHT	MIGHT	MIGHT	MIGHT
14	BLIGHT	LIGHT	BLIGHT	BLIDE	BLIGHT	MIGHT	MIGHT	MIGHT	MIPE	MIGHT
15	LIGHT	LIGHT	LIGHT	LIGHT	LIGHT	LIGHT	MIGHT	MY	MIGHT	MY
16	BLIGHT	BLIGHT	BLIGHT	LIGHT	BLIGHT	MULT	MULT	MULT	MULT	MULT
17	LIGHT	LIGHT	BLIND	+	+	MIGHT	MIGHT	MIGHT	MIGHT	MIGHT
18	LIGHT	LIGHT	LIGHT	LIGHT	LIGHT	MIGHT	MIGHT	MIGHT	MIGHT	MIGHT
19	LIGHT	LIGHT	LIGHT	BLIGHT	LIGHT	+	+	+	+	+
20	LIGHT	LIGHT	LIGHT	LIGHT	LIGHT	MONTH	MONTH	MONTH	MONTH	MONTH
21	LIGHT	LIGHT	LIGHT	BLIGHT	BLIGHT	MICE	MICE	MIGHT	PIPES	MIGHT
22	LIGHT	BLIGHT	LIGHT	BLIGHT	LIGHT	LEASE	MIGHT	MIGHTS	MIGHT	MIGHT
23	LIGHT	LIGHT	LIGHT	LIGHT	LIGHT	LIGHT	LIGHT	LIGHT	LIGHT	LIGHT
24	LIGHT	LIGHT	LIGHT	LIGHT	LIGHT	MICE	MITCH	MITCH	MITCH	MITCH
25	LIGHT	LIGHT	LIGHT	LIGHT	LIGHT	MICE	MICE	MIGHT	MICE	MIGHT
26	LIGHT	LIGHT	LIGHT	LIGHT	+	MEAT	MEAT	MATE	MATE	MATE
27	LIGHT	BLIGHT	LIGHT	LIGHT	BLIGHT	MIGHT	MIGHT	MIGHTS	MIGHT	MIGHT
28	LIGHT	LIGHT	LIGHT	LIGHT	BLIGHT	MIGHT	MIGHT	MIGHT	+	+
29	LIGHT	LIGHT	LIGHT	LIGHT	LIGHT	MIGHT	MIGHT	MIGHT	MIGHT	MIGHT
30	LIGHT	LIGHT	LIGHT	LIGHT	LIGHT	MICE	MIGHT	MIGHT	MIGHT	MIGHT
31	LIGHT	LIGHT	LIGHT	LIGHT	LIGHT	MICE	MIGHT	MICE	MICE	MIGHT
32	LIGHT	WHITE	WHITE	WHITE	BLIGHT	MIKE	MIKE	MIKE	MIKE	MIKE
NUMBER										
CORRECT:	0	0	0	1	2	1	2	1	3	3

# Appendix E

Subject Responses for the Speech Synthesized Word "Lab" in the Single Word Conditions.

SUBJECT	VOTRAX PRESENTATION NUMBER					ECHO PRESENTATION NUMBER				
	1	2	3	4	5	1	2	3	4	5
1	BLEND	BLELL	BLAB	BLAB	BLAB	MERF	MAP	MAP	MAP	MAP
2	LEAD	LAD	+	+	+	WA	WA	WA	LA	WA
3	GLEN	GLEN	GLEN	GLEN	GLEN	MAN	MAP	MAP	MAP	MAP
4	GLAD	GLAD	GLAD	GLAD	GLAD	N/R	N/R	N/R	N/R	N/R
5	BLED	BLED	BLED	BLEB	BLED	MEN	MET	MEN	MEN	MET
6	N/R	LELL	BLAB	LAD	LADLE	N/R	N/R	N/R	N/R	MA
7	GLAD	GLAD	GLAD	GLAD	GLAD	MATH	MAN	MAN	MAM	MAN
8	EBB	LEB	EBB	LEB	LEB	MER	MAP	MAP	MAP	MAP
9	BLAD	GLAD	GLAD	GLAD	BLAD	MAP	LAT	MAP	LAT	LAT
10	BLAD	BLAD	BLAD	BLAD	GLAD	MAT	BLAT	MAT	MAT	BLACK
11	GLAD	GLAD	GLAD	GLAD	N/R	MAT	MAT	MAT	MAT	MAT
12	LAD	LAD	N/R	BLAD	GLAD	MAN	MAN	MATH	MATH	MAT
13	BLAB	BLAB	+	+	+	MAT	MAT	MAT	MAP	MAT
14	+	BLAB	+	+	+	LAMP	LAP	LAP	LAP	LAP
15	ABLE	BLA	N/R	N/R	ABLE	LAV	LA	LA	LAP	LAT
16	BLAL	BLAL	BLAB	BLAB	BLAB	MA	ME	ME	MER	MA
17	BLED	LEAD	+	+	+	MAT	MAT	MAT	MAT	MAT
18	GLAD	GLAD	GLAD	BLED	BLED	AT	LET	MAT	LET	LAST
19	WEB	WEB	WEB	WEB	WEB	MAP	MAP	MAP	MAP	MAP
20	LAMP	LAMP	LAMP	LAMP	LAMP	MER	MER	NURSE	N/R	MAN
21	BLED	BLED	BLED	BLED	BLED	LAT	LET	LET	LET	LAT
22	LEN	WELL	BLEN	WELL	BLELL	MA	MA	MA	MA	MAT
23	LET	LET	LET	LET	LET	LET	LET	LET	LET	LET
24	BLE	BLABBLE	BLADLE	BLABBLE	BLABBLE	MAT	MAN	MAN	MA	MA
25	LET	LET	EBB	EBB	EBB	MAN	LET	LET	MAN	LET
26	GLAD	GLAB	GLAB	GLAB	GLAB	LAMB	MAT	MAT	MAT	MAT
27	LAP	BLEP	BLEB	LEB	GLAB	MAT	MAP	LEP	MAT	MA
28	BLAB	BLAB	BLAB	BLAB	BLAB	LAT	LAMP	LAMP	LAMP	LAMP
29	GLAD	N/R	N/R	GLAD	GLAD	N/R	N/R	N/R	N/R	N/R
30	+	+	+	BLAB	+	MAT	MAT	MAT	MAT	MAT
31	GLAD	GLAD	THEM	GLAD	GLAD	MAT	MAT	MAT	MAN	MAT
32	LEB	BLIP	BLEB	BLED	BLED	MACK	THAT	MACK	MAT	MAT
NUMBER CORRECT:	2	1	5	4	5	0	0	0	0	0

# Appendix E

Subject Responses for the Speech Synthesized Word "Cat" in the Single Word Conditions.

SUBJECT	VOTRAX					ECHO				
	PRESENTATION NUMBER					PRESENTATION NUMBER				
	1	2	3	4	5	1	2	3	4	5
1	HAT	HAT	FAT	HAT	HAT	APTS	FIRST	VAST	ABST	APPS
2	AT	AT	AT	AT	AT	AT	AT	AT	AT	AT
3	DEAD	+	DEAD	DEAD	DEAD	MAPS	MAPS	MAPS	MAPS	MAPS
4	AT	HAT	HAT	HAT	HAT	N/R	MATCH	MATCH	HAT	N/R
5	PET	BET	ET	ET	ET	HET	MET	ET	ET	HET
6	AT	AT	AT	AT	AT	MAPS	N/R	N/R	N/R	ATS
7	DEBTS	AT	GAT	AT	GAT	MATCH	MATCH	MATCH	MAT	MATCH
8	HEAD	AT	AT	AT	AT	HAT	HATCH	HAT	HAT	HAT
9	FAT	FAT	FAT	+	GAT	AT	AT	AT	FAT	AT
10	AT	AT	ET	ET	ET	AT	MATCH	MATCH	AT	AT
11	+	+	+	+	+	+	FAT	PATCH	FAT	PATCH
12	THAT	THAT	THAT	N/R	THAT	ATH	ATCH	ATCH	HATCH	PABST
13	AT	AT	AT	AT	AT	MAPS	PABST	PABST	PABST	PABST
14	HAT	+	THAT	+	+	MAPS	PATCH	PATCH	CAPS	CAPS
15	AT	ET	AT	AT	AT	AT	AT	A	HAT	HAT
16	AT	AT	AT	AT	AT	A	ON	ON	A	UN
17	DEAD	NET	DEBT	AT	AT	MATCH	+	PAT	PATCH	PATCH
18	AT	AT	AT	AT	AT	CATCH	CATCH	CATCH	CATCH	AT
19	+	GET	BED	GET	GET	MAPS	AT	MAPS	MAPS	MAPS
20	DEAD	+	+	+	+	MER	MA	N/R	CAN	MER
21	TAT	AT	TAT	AT	GET	MAPS	MAPS	MAPS	MAPS	MAPS
22	AT	+	GET	GET	GET	MATCH	MATCH	ATCH	MATCH	MATCH
23	AT	AT	AT	AT	AT	AT	AT	AT	AT	AT
24	ET	AT	HAT	HAT	HAT	MATCH	ATCH	MATCH	NATCH	MATCH
25	AT	AT	AT	AT	AT	AT	AT	AT	AT	AT
26	+	AT	AT	AT	AT	MAT	AT	MAT	+	AT
27	AT	AT	GAT	GAT	GET	ATS	APF	APF	AP	ATCH
28	AT	GET	GAT	+	GAT	AT	AT	+	AT	HAT
29	AT	AT	AT	AT	AT	AT	AT	AT	AT	AT
30	DEBT	DEBT	THAT	THAT	THAT	PAT	PAT	PAT	PAT	PAT
31	GET	GET	GET	GET	GET	HURT	PERHAPS	PERHAPS	MEPS	PERHAPS
32	PAT	AT	AT	AT	AT	MAT	MAT	BAT	AT	MAT
NUMBER CORRECT:	3	5	2	5	3	1	1	1	1	0

# Appendix F.

Subject Responses for the Speech Synthesized Word "Yes" in the Low Probability Sentence Condition.

SUBJECT	VOTRAX PRESENTATION NUMBER					ECHO PRESENTATION NUMBER				
	1	2	3	4	5	1	2	3	4	5
1	+	+	+	+	+	+	+	+	+	+
2	+	+	+	+	+	+	+	+	+	+
3	+	+	+	+	+	+	+	+	+	+
4	+	+	+	+	+	+	+	+	+	+
5	+	+	+	+	+	+	+	+	+	+
6	+	+	+	+	+	+	YANZ	+	+	+
7	+	+	+	+	+	+	+	+	+	+
8	+	+	+	+	+	+	+	+	+	+
9	+	+	+	+	+	+	+	+	+	+
10	+	+	+	+	+	+	+	+	+	+
11	+	+	+	+	+	+	+	+	+	+
12	+	+	+	+	+	+	+	+	+	+
13	NEST	+	+	+	+	+	+	+	+	+
14	+	+	+	+	+	+	+	+	+	+
15	+	+	+	+	+	+	+	+	+	+
16	+	+	+	+	+	+	+	+	+	+
17	NEST	NEST	LESS	+	NEST	NEST	+	+	+	+
18	+	+	+	+	+	+	+	+	+	+
19	+	+	+	+	+	+	+	+	+	+
20	+	+	+	+	+	+	+	+	+	+
21	+	+	+	+	+	+	+	+	+	+
22	+	+	+	+	+	+	+	+	+	+
23	+	+	+	+	+	+	+	+	+	+
24	NESS	NESS	MESS	MESS	MESS	MESS	NYES	NYES	MESS	NYES
25	+	+	+	+	+	+	+	+	+	+
26	LISP	LISP	LISP	LISP	LISP	NURSE	NURSE	NURSE	NURSE	NURSE
27	+	YES	+	+	+	+	+	+	+	+
28	+	+	+	+	+	+	+	+	+	+
29	+	+	+	+	+	+	+	+	+	+
30	+	+	+	+	+	NEST	NEST	NEST	NEST	NEST
31	+	+	+	+	+	+	+	+	+	+
32	+	+	+	+	+	YET	YET	YET	YET	YET
NUMBER CORRECT:	28	28	29	30	29	27	27	28	28	28

Appendix F.

Subject Responses for the Speech Synthesized Word "Hurt" in the Low Probability Sentence Condition.

SUBJECT	VOYTRAX PRESENTATION NUMBER					ECHO PRESENTATION NUMBER				
	1	2	3	4	5	1	2	3	4	5
1	SHIRTS	SHIRT	SHIRT	SHIRT	SHIRTS	ERPST	ERPST	ERPST	ERPST	ERPST
2	EARTH	EARTH	EARTH	EARTH	EARTH	FIRST	FIRST	FIRST	EARTH	EARTH
3	+	SHIRT	SHIRT	GERT	GERT	FIRST	FIRST	FIRST	FIRST	FIRST
4	SHIRT	+	+	+	+	FIRST	FIRST	FIRST	FIRST	FIRST
5	SHIRT	SHIRT	SHIRT	SHIRT	SHIRT	+	+	+	+	+
6	CURT	CURT	CURT	CURT	CURT	HERTZ	HERTZ	FIRST	HERTZ	HERTZ
7	EARTH	EARTH	EARTH	EARTH	EARTH	VERSE	FIRST	VERSE	FIRST	EARTH
8	+	SHIRT	SHIRT	SHIRT	SHIRT	+	+	+	+	+
9	SHIRT	SHIRT	SHIRT	SHIRT	SHIRT	VERB	FIRST	VERB	VERB	VERB
10	+	+	+	+	+	HER	HER	HER	HER	HER
11	SHIRT	SHIRT	SHIRT	SHIRT	SHIRT	FUR	FIRST	FIRST	FIRST	FIRST
12	EARTH	EARTH	EARTH	EARTH	EARTH	VERB	VERB	FIRST	FIRST	EARTH
13	CARROT	CARROT	CARROT	CARROT	N/R	FIRST	FIRST	FIRST	FIRST	FIRST
14	SHIRT	SHIRT	SHIRTS	SHIRTS	SHIRTS	VERSE	VERSE	HURTS	VERSE	VERSE
15	SHIRT	+	SHIRT	SHIRT	SHIRT	HER	HER	HER	HER	HER
16	ERT	+	GERT	+	+	ERP	ERT	ERTCH	ERT	ERT
17	+	+	SHIRT	SHIRT	SHIRT	SHIRT	+	+	+	+
18	+	SHIRT	SHIRT	SHIRT	SHIRT	+	+	+	+	+
19	SHIRT	SHIRT	BIRD	SHIRT	BIRD	EARTH	EARTH	EARTH	EARTH	EARTH
20	SHIRT	SHIRT	SHIRT	SHIRT	SHIRT	SHIRT	BIRD	BIRD	BIRD	BIRD
21	SHIRT	SHIRT	SHIRT	SHIRT	SHIRT	FIRST	FIRST	FIRST	FIRST	FIRST
22	GERT	GERT	GERT	+	+	BERT	+	ERT	ERT	+
23	SHIRT	SHIRT	SHIRT	+	SHIRT	+	+	+	+	+
24	SHIRT	JERT	SHIRT	SHIRT	SHIRT	BIRCH	BIRCH	BIRCH	BIRCH	BIRCH
25	EARTH	EARTH	EARTH	EARTH	EARTH	HER	HER	HER	HER	HER
26	EARTH	+	+	+	+	+	+	+	+	+
27	SHERP	CURT	SHIRT	SHIRT	SHIRT	BERT	BURP	ERP	BERT	BERT
28	SHIRT	SHIRT	+	SHIRT	SHIRT	BIRD	+	BERT	BERT	+
29	SHIRT	SHIRT	SHIRT	SHIRT	SHIRT	HERST	+	+	+	+
30	SHIRT	SHIRT	SHIRT	SHIRT	SHIRT	+	+	+	+	+
31	+	SHIRT	SHIRT	SHIRT	SHIRT	+	+	+	+	+
32	SHIRT	EARTH	EARTH	EARTH	EARTH	BERT	BURP	BURP	BERT	BURP
NUMBER CORRECT:	6	6	4	6	5	7	11	9	9	11

Appendix F.

Subject Responses for the Speech Synthesized Word "Watch" in the Low Probability Sentence Condition.

SUBJECT	VOTRAX PRESENTATION NUMBER					ECHO PRESENTATION NUMBER				
	1	2	3	4	5	1	2	3	4	5
1	+	+	+	+	+	MUCH	MUCH	+	+	+
2	LOTCH	+	+	+	+	N/R	LA	+	ONE	ONE
3	MUCH	MUCH	+	+	+	MARCH	MUCH	+	+	+
4	+	+	+	+	+	+	+	+	+	+
5	BLOTCH	+	+	+	+	+	MUCH	+	+	+
6	LOTCH	LOTCH	LOTCH	LOTCH	LOTCH	+	+	WANCH	+	+
7	LODGE	LODGE	LODGE	LODGE	LODGE	+	+	+	+	+
8	+	+	+	+	+	+	+	+	+	+
9	LOCK	+	LOTCH	+	+	LOVE	ONE	JUAN	WHAT	LINE
10	+	+	+	+	+	LOTCH	LAUNCH	+	WANTCH	ONCE
11	LODGE	LODGE	LODGE	LODGE	LODGE	LODGE	MAWLCH	MAWLCH	MULSH	MATCH
12	LARGE	LARGE	LARGE	LARGE	LARGE	+	MARCH	LARGE	MARCH	MARCH
13	LOT	LOT	LOT	LOT	LOT	MARCH	MARCH	+	+	MARCH
14	+	+	+	+	+	+	+	+	+	+
15	LOT	LA	LAWT	LAWT	LAWT	WALK	WALK	WA	WALK	WALK
16	LOTCH	+	+	+	+	+	WUTCH	+	WUTCH	+
17	+	+	+	+	+	+	+	+	+	+
18	+	+	+	+	+	+	+	+	+	+
19	+	+	+	+	+	MUCH	MUCH	MUCH	+	MUCH
20	+	+	+	+	+	+	+	+	+	+
21	LOT	LOT	LOT	LOT	LOT	MUCH	MUCH	MUCH	MUCH	MUCH
22	LATCH	+	+	+	+	+	MOTCH	+	MOTCH	MOTCH
23	LOT	LOT	LOT	LOT	LOT	+	LOT	+	+	LOT
24	LOTCH	LOTCH	LOTCH	LOTCH	LOTCH	+	+	MOTCH	+	+
25	LOT	+	LOT	+	+	ONE	ONE	ONE	ONE	ONE
26	LOCKED	LOCKED	LOCKED	LOCKED	LOCKED	LUNCH	LUNCH	LUNCH	LUNCH	+
27	+	+	+	+	+	+	MUCH	MOTCH	+	MOTCH
28	LODGE	LODGE	+	+	+	+	+	+	+	+
29	+	+	+	+	+	MARCH	MARCH	MARCH	MARCH	MARCH
30	LATCH	+	+	+	+	+	+	+	+	+
31	LOT	+	+	+	+	RAFT	+	+	+	+
32	+	+	+	+	+	WALK	WALK	WALK	WALK	WALK
NUMBER CORRECT:	12	20	20	22	22	17	12	18	19	17

# Appendix F.

Subject Responses for the Speech Synthesized Word "Fall" in the Low Probability Sentence Condition.

SUBJECT	VOTRAX PRESENTATION NUMBER					ECHO PRESENTATION NUMBER				
	1	2	3	4	5	1	2	3	4	5
1	+	+	+	+	+	HOME	PHONE	HOME	HOME	HOME
2	ALL	ALL	+	+	+	ON	ON	ON	ON	ON
3	FULL	+	+	+	+	HOME	HOME	HOME	HOME	HOME
4	+	+	+	+	+	FUN	FUN	FUN	+	+
5	+	+	+	+	+	ON	UM	ON	ON	ON
6	+	+	+	FOWL	FOWL	ON	ON	ON	UN	ON
7	VOWEL	+	+	+	+	MUM	GLUM	GLUM	GLUM	GLUM
8	FULL	SWALLOW	FULL	SWALLOW	SWALLOW	PHONE	FOAM	FOAM	FOAM	FOAM
9	+	+	+	+	+	FUN	FUN	FUN	FUN	FUN
10	+	+	+	+	+	+	ON	ALL	ALL	ALL
11	+	+	+	+	+	FUME	FUME	FUME	FUME	MUM
12	ULL	ALL	ALL	ALL	ALL	ON	ON	ON	ON	ON
13	+	+	+	+	+	PHONE	PHONE	FOAM	FOAM	FOAM
14	+	+	+	+	+	+	+	+	+	+
15	+	+	ULL	ALL	+	ULL	ALL	ULL	ALL	ULL
16	+	+	FUL	+	+	UM	UM	UM	UM	UM
17	ALL	+	FOWL	+	+	PHONE	PHONE	PHONE	PHONE	PHONE
18	+	+	+	+	+	COME	COME	FUN	FUN	FUN
19	+	+	+	+	+	+	+	+	+	+
20	+	+	+	+	BALL	BOMB	MDM	MDM	BOMB	BOMB
21	+	+	+	+	+	UG	UG	UG	UG	UG
22	+	+	+	+	+	+	+	+	+	ALL
23	FAW	SOW	SOW	SOW	SOW	THUMB	THUMB	THUMB	FUN	FUN
24	JLALL	JLALL	SHLALL	JLALL	JLALL	ULL	ULL	ULL	ULL	ULL
25	ULL	ULL	ULL	ULL	ULL	FUN	FUN	FUN	FUN	FUN
26	SULL	SULL	SULL	SULL	SULL	FUN	FUN	FUN	FUN	FUN
27	BUL	ULL	BUL	BALL	BALL	UB	BUL	BUL	BUL	BUL
28	+	+	+	+	+	ON	ON	ON	ON	ON
29	BALL	BALL	BALL	BALL	ALL	UM	OWN	OWN	OHM	OHM
30	+	+	+	+	+	PHONE	PHONE	FUN	FUN	FUN
31	+	+	+	+	+	FUN	UN	HIM	HOME	BOMB
32	+	+	+	+	+	PHONE	PHONE	PHONE	PHONE	PHONE
NUMBER										
ORDER:	20	23	21	22	22	4	3	3	4	3



Subject Responses for the Speech Synthesized word "June" in the Low Probability Sentence Condition.

SUBJECT	VOTRAX					ECHO				
	PRESENTATION NUMBER					PRESENTATION NUMBER				
	1	2	3	4	5	1	2	3	4	5
1	+	+	+	+	+	+	+	+	+	+
2	+	+	+	+	+	+	+	+	+	+
3	+	+	+	+	+	+	+	+	+	+
4	+	+	+	+	+	+	+	+	+	+
5	+	+	+	+	+	+	+	+	+	+
6	+	+	+	+	+	+	+	+	+	+
7	+	+	+	+	+	+	+	+	+	+
8	+	+	+	+	+	+	+	+	+	+
9	+	+	+	+	+	+	+	+	+	+
10	+	+	+	+	+	+	+	+	+	+
11	+	+	+	+	+	+	+	+	+	+
12	+	+	+	+	+	+	+	+	+	+
13	+	+	+	+	+	+	+	+	+	+
14	+	+	+	+	+	+	+	+	+	+
15	+	+	+	+	+	+	+	+	+	+
16	+	+	+	+	+	+	+	+	+	+
17	+	+	+	+	+	+	+	+	+	+
18	+	+	+	+	+	+	+	+	+	+
19	+	+	+	+	+	+	+	+	+	+
20	+	+	+	+	+	+	+	+	+	+
21	+	+	+	+	+	+	+	+	+	+
22	+	+	+	+	+	+	+	+	+	+
23	+	+	+	+	+	+	+	+	+	+
24	+	+	+	+	+	+	+	+	+	+
25	+	+	+	+	+	+	+	+	+	+
26	+	+	+	+	+	+	+	+	+	+
27	+	+	+	+	+	+	+	+	+	+
28	+	+	+	+	+	+	+	+	+	+
29	+	+	+	+	+	+	+	+	+	+
30	+	+	+	+	+	+	+	+	+	+
31	+	+	+	+	+	+	+	+	+	+
32	+	+	+	+	+	+	+	+	+	+
NUMBER										
CORRECT:	32	32	32	32	32	32	32	32	32	32

# Appendix F.

Subject Responses for the Speech Synthesized Word "Thing" in the Low Probability Sentence Condition.

SUBJECT	VOTRAX PRESENTATION NUMBER					ECHO PRESENTATION NUMBER				
	1	2	3	4	5	1	2	3	4	5
1	SIN	SIN	SIN	IN	SIN	SIN	SIN	SIN	THIN	THIN
2	SIN	ZIN	ZIM	ZIN	SIN	ZIM	ZIM	ZIM	ZIM	ZIM
3	SIN	SIN	SIN	SIN	SIN	THIN	WOMEN	WOMEN	WOMEN	WOMEN
4	SIN	THIN	THIN	THIN	THIN	THIN	THIN	THIN	THIN	THIN
5	SIN	SIN	SIN	SIN	SIN	ZIM	HIM	HIM	HIM	HIM
6	SIN	ZIN	ZIN	ZIN	ZIN	IN	IN	THIN	THIN	THIN
7	IN	ZIM	ZIN	ZIN	ZIN	THIN	THIN	THIN	THIN	THIN
8	THIN	THIN	THIN	THIN	THIN	THIN	THIN	SIN	THIN	THIN
9	SIN	SIN	SIN	SIN	SIN	THIN	THIN	THIN	THIN	THIN
10	SELL	SELL	SELL	SELL	ELLE	BIM	HIM	HIM	HIM	HIM
11	SELL	SIN	SELL	SIN	SIN	SIN	FUME	FUME	FUME	FUME
12	IN	ZIN	ZIN	IN	ZIN	THIN	ZIN	THIN	THIN	THIN
13	THIN	THIN	THIN	SIN	THIN	FIN	N/R	SWIM	SWIM	SWIM
14	SIN	ZIN	ZIN	ZIN	ZIN	SIM	SIM	SIM	SIM	SIN
15	SING	SING	SING	SING	SIN	HIM	HIM	HIM	HIM	HIM
16	ZEAL	ZING	ZIN	ZIN	ZIN	THIN	THIN	THIN	THIN	THIN
17	THIN	THIN	THIN	THIN	THIN	THIN	THIN	THIN	THIN	THIN
18	SIN	SIN	SIN	SIN	SIN	SIN	SIN	THIN	THIN	THIN
19	SIN	SIN	SIN	SIN	SIN	SIN	SIN	SIN	SIN	SIN
20	SIN	SIN	SIN	SIN	SIN	SIN	SIN	SIN	THIN	SIN
21	THIN	THIN	THIN	THIN	THIN	THIN	SIN	THIN	THIN	THIN
22	SILL	SILL	SILL	SEAL	SILL	BIM	FIM	FIM	FIM	FIM
23	SIN	SIN	SIN	SIN	SIN	SIN	SIN	SIN	THIN	THIN
24	ZIN	ZIN	ZIN	ZIN	ZIN	IM	IM	IM	IM	IM
25	SIN	SIN	SIN	SIN	SIN	SIN	SIN	THIN	THIN	THIN
26	SIN	SIN	SIN	SIN	IN	THIN	THIN	THIN	THIN	THIN
27	ZIN	ZIM	ZIM	ZIN	ZIM	ZIM	ZIM	ZIM	ZIM	ZIM
28	SIN	SIN	SIN	SIN	SIN	THIN	THIN	THIN	THIN	THIN
29	SIN	SIN	SIN	SIN	SIN	SING	SIN	SIN	SIN	SIN
30	IN	IN	SIN	IN	SIN	SIN	IN	IN	IN	SIN
31	SIN	SIN	SIN	SIN	SIN	HIM	HIM	HIM	SIN	HIM
32	SIN	SIN	SIN	SIN	SIN	FIM	BIN	BIN	TIM	BIN

NUMBER  
CORRECT:

0 0 0 0 0 0 0 0 0 0 0

## Appendix F.

Subject Responses for the Speech Synthesized Word "Bath" in the Low Probability Sentence Condition.

SUBJECT	VOTRAX					ECHO				
	PRESENTATION NUMBER					PRESENTATION NUMBER				
	1	2	3	4	5	1	2	3	4	5
1	BEST	LESS	LESS	BEST	BEST	LESS	LESS	LESS	LESS	LESS
2	THAT	THAT	THAT	THAT	THAT	LESS	LESS	LESS	LESS	MASS
3	LET	BEST	LESS	LESS	LESS	LAST	LAST	LAST	MASS	YES
4	BEST	BEST	BEST	BEST	BEST	MESS	MASS	MESS	MESS	MASS
5	BET	BET	BET	BET	BET	MESS	MESS	MESS	MESS	MASS
6	BETH	BEST	BESS	BESS	BEST	MATH	MATH	MATH	MASS	MESS
7	BEST	BEST	BEST	BEST	BEST	MASK	MASK	MASK	MASK	MASK
8	BEST	BESS	BESS	BEST	BEST	MESS	MESS	MESS	MESS	MESS
9	BAST	BASK	LAST	BASK	BASK	MAP	LAP	MAP	MAP	MAT
10	THAT	THAT	THAT	THAT	THAT	MAST	MAST	MASS	MASS	MASK
11	BAT	LESS	LESS	LESS	BEST	MATH	MATH	MATH	MATH	MATCH
12	BEST	BEST	BEST	BET	BET	MATH	MATH	MATH	MATH	MATH
13	BAT	LESS	BEST	VEST	BEST	MATH	MATH	MATH	MASK	MASK
14	DESK	BASS	THIS	BEST	BEST	MASK	MASK	MASK	MASK	MASK
15	LESS	LESS	LESS	BEST	LESS	MESS	LESS	MESS	MESS	MASK
16	BESS	BESS	BASS	BESS	BASS	MATH	MATH	MATH	MATH	MATH
17	BEST	BEST	BEST	BEST	BEST	MATH	MATH	MAT	MATH	MATH
18	BEST	LESS	BEST	BEST	BEST	MESS	MESS	MESS	MESS	MESS
19	BEST	BEST	BEST	BEST	BEST	MASS	MASS	MASS	MASS	MASS
20	DRESS	DRESS	DRESS	DRESS	DRESS	DRESS	MESS	MAN	MAN	MAN
21	LET	LIST	LESS	LIT	LET	MESS	MESS	MESS	MESS	MESS
22	BESS	BESS	BESS	BESS	BESS	MATH	MATH	MATH	MATH	MATH
23	LESS	LESS	LESS	LESS	LESS	LESS	LESS	LESS	LESS	LESS
24	ME	MESS	BLESS	MESS	BLESS	ME	MATCH	MATCH	MATCH	MA
25	LEST	LESS	LET	LET	LET	MESS	MESS	MESS	MESS	MESS
26	BEST	BEST	BEST	BEST	BEST	MATH	MATH	MATH	MATH	MATH
27	SESS	BESS	BEST	BEST	BEST	MESS	MESS	MESS	MAS	MAS
28	BEST	BLESS	BEST	BASS	BEST	LAMP	LAMP	LAP	LAP	LAP
29	BET	BEST	BEST	BEST	BEST	MESS	MESS	MESS	MESS	MESS
30	BED	LIST	THAT	BET	BET	MASK	MASK	MASK	MASK	MASK
31	BEST	BEST	BEST	BET	BET	MAP	MAT	MAP	LAST	LAST
32	BET	BET	BET	BET	BET	MAT	MAT	MAT	MAT	MET

NUMBER

CORRECT: 0 0 0 0 0 0 0 0 0 0 0

# Appendix F.

Subject Responses for the Speech Synthesized Word "Knife" in the Low Probability Sentence Condition.

SUBJECT	VOTRAX PRESENTATION NUMBER					ECHO PRESENTATION NUMBER				
	1	2	3	4	5	1	2	3	4	5
1	LIFE	LIFE	LIFE	LIFE	LIFE	LIFE	LIFE	LIFE	LIFE	LIFE
2	LIFE	LIFE	LIFE	LIFE	LIFE	LIFE	LIFE	LIFE	LIFE	LIFE
3	LIFE	LIFE	LIFE	LIFE	LIFE	LIFE	LIFE	LIFE	LIFE	LIFE
4	WIFE	WIFE	WIFE	WIFE	WIFE	LIFE	+	LIFE	LIFE	LIFE
5	LIFE	LIFE	LIFE	LIFE	LIFE	+	LIFE	LIFE	LIFE	LIFE
6	LIFE	LIFE	LIFE	LIFE	LIFE	+	+	+	+	+
7	LICE	LIFE	LIFE	LIFE	LIFE	+	+	+	+	+
8	LIFE	LIFE	LIFE	LIFE	LIFE	LIFE	MIGHT	WIFE	LIFE	LIFE
9	LIFE	LIFE	LIFE	LIFE	LIFE	LIFE	LIFE	LIFE	LIGHT	LIFE
10	LIFE	LIFE	LIFE	LIFE	LIFE	MAIF	MIFE	MIFE	MIFE	MATE
11	LIFE	LIFE	LIFE	LIFE	LIFE	LIFE	WIFE	WIFE	WIFE	WIFE
12	LIFE	LIFE	LIFE	LIFE	LIGHT	LIFE	LIFE	LIFE	LIFE	LIFE
13	LIFE	LIFE	LIFE	LIFE	LIFE	+	+	+	+	+
14	LICE	LIFE	LIFE	LIFE	LIFE	+	MICE	MICE	MICE	MICE
15	LIFE	LIFE	LIFE	LIFE	LIFE	LIFE	LIFE	LIFE	LIFE	LIFE
16	LIKE	LIKE	LIKE	LIKE	LIKE	WIFE	MIFE	MIFE	MIFE	MIFE
17	+	+	+	+	+	+	+	+	NIGHT	MATE
18	LIES	LIES	LIES	LIES	LIFE	LIFE	LIFE	LIFE	LIFE	LIFE
19	LIFE	LIFE	LIFE	LIFE	LIFE	LIFE	LIFE	LIFE	LIFE	LIFE
20	WIFE	WIFE	WIFE	WIFE	WIFE	LIFE	LIFE	LIFE	LIFE	LIFE
21	LIFE	LIFE	LIFE	LIFE	LIFE	LIFE	LIFE	LIFE	MIFE	WIFE
22	LIFE	LIFE	LIFE	LIFE	LIFE	LIFE	LIFE	LIFE	LIFE	LIFE
23	LIFE	LIFE	LIFE	LIFE	LIFE	LIFE	LIFE	LIFE	LIFE	LIFE
24	MICE	MICE	LICE	MICE	MICE	MY	MY	MY	MY	MY
25	LICE	LIFE	LIFE	LIFE	LIFE	LIFE	LIFE	LIFE	LIFE	LIFE
26	LIFE	NICE	+	LIFE	+	+	+	+	+	+
27	LIFE	LIFE	LIFE	LIFE	LIFE	LIFE	LIFE	LIFE	LIFE	LIFE
28	LIFE	LIFE	LIFE	LIFE	LIFE	+	+	+	+	+
29	LIFE	LIFE	LIFE	LIFE	LIFE	LIFE	LIFE	+	+	+
30	MICE	LIFE	LIGHT	LIGHT	LIGHT	MICE	MICE	MICE	MICE	MICE
31	LICE	LICE	LICE	LICE	LIFE	LIGHT	LIFE	LIFE	LIGHT	LIFE
32	WIFE	WIFE	WIFE	WIFE	WIFE	MIKE	MIKE	MIGHT	MIGHT	MIGHT
NUMBER CORRECT:	1	1	2	1	2	8	7	7	6	6

## Appendix F.

Subject Responses for the Speech Synthesized Word "Cab" in the Low Probability Sentence Condition.

SUBJECT	VOTRAX					ECHO				
	PRESENTATION NUMBER					PRESENTATION NUMBER				
	1	2	3	4	5	1	2	3	4	5
1	AP	APPLE	EBB	EBB	EPP	AP	AT	AT	AP	AT
2	ED	ED	ED	ED	ED	AT	AT	AT	AT	AT
3	AND	GET	ODW	CAN	GET	AT	AT	AT	AT	AT
4	N/R	N/R	N/R	N/R	N/R	HAT	HAT	N/R	N/R	N/R
5	YED	HEAD	HEAD	HEAD	HEAD	HAT	AT	AT	AT	AT
6	N/R	GET	GET	GEL	GET	AT	FAT	AT	AT	AT
7	SADDLE	WELL	CATTLE	CATTLE	WELL	AT	AT	AT	HAT	AT
8	EBB	EBB	EBB	EBB	EBB	HAT	HAT	HAT	HAT	APT
9	AGAIN	CAT	LAT	CAD	AT	THAT	FAT	THAT	AT	AT
10	ELLE	ELLE	ELLE	ELLE	ELLE	AT	AT	AT	AT	AT
11	ELLE	LELL	CAT	LEAD	LEAD	CAT	CAT	BAT	CAT	CAT
12	ADD	ADD	ADD	ADD	ADD	AT	AT	AT	AT	AT
13	EBB	EBB	EBB	EBB	EBB	AT	FAT	FAT	AT	HAT
14	ABLE	DABBLE	TABLE	TABLE	TABLE	CAT	PAT	CAT	CAT	CAT
15	N/R	TABLE	ABLE	DABLE	ABLE	AT	HET	AT	AT	AT
16	EP	ABB	APP	ABB	ABB	AT	AT	AT	AT	APP
17	DEB	DEB	DEB	LAB	DEB	AT	HAT	CAT	AT	AT
18	AT	AT	AT	AT	EBB	AT	FAT	FAT	FAT	FAT
19	WEB	WEB	WEB	WEB	WEB	AT	AT	AT	AT	AT
20	CABIN	CAT	CABLE	CAP	CABLE	CAT	FAT	CAN	CAN	MAN
21	ED	ET	LET	ET	ET	AT	ET	ET	ET	ET
22	KEB	GEB	GEB	GEB	GEB	A	A	A	A	A
23	AT	AT	AT	AT	AT	AT	AT	AT	AT	AT
24	UB	EBBLE	EBBLE	EBBLE	EBBLE	MA	HAT	AT	A	A
25	EBB	EBB	EBB	EBB	EBB	AT	AT	AT	AT	AT
26	DAB	DAB	DAB	DAB	DAB	AT	AT	AT	AT	AT
27	GAB	GAB	GEB	GAB	GAB	UP	MAP	BAT	AP	BAT
28	GAB	GAB	GAB	GAB	GAB	AT	AT	AT	AT	AT
29	EBB	EBB	EBB	EBB	EBB	AT	AT	AT	AT	AT
30	TAB	TAB	TAB	TAB	TAB	HAT	PAT	HAT	PAT	HAT
31	AT	GET	GET	GET	GET	AT	AT	AT	AT	AT
32	EBB	EBB	EBB	EBB	WEB	BAT	AT	BAT	MAT	MAT

NUMBER  
CORRECT:

Appendix F.

Subject Responses for the Speech Synthesized Word "Less" in the Low Probability Sentence Condition.

SUBJECT	VOTRAX PRESENTATION NUMBER					ECHO PRESENTATION NUMBER				
	1	2	3	4	5	1	2	3	4	5
1	+	+	+	+	+	U.S.	U.S.	U.S.	U.S.	U.S.
2	+	+	+	+	+	+	+	+	+	+
3	+	+	+	+	+	YES	+	YES	+	+
4	+	+	+	+	+	+	N/R	+	N/R	N/R
5	LIST	+	+	+	+	+	+	+	+	+
6	+	+	+	+	+	+	+	+	+	+
7	"S"	WEST	ASK	LIST	WEST	MASK	MESS	ASK	MASK	MISS
8	LIST	+	+	+	+	REST	+	YES	+	+
9	LIST	LIST	LIST	LIST	LIST	LET	LIST	LET	LET	LET
10	LIST	LIST	+	+	+	LIST	+	+	+	+
11	GLASS	+	+	+	+	YES	+	YES	YES	YES
12	LIST	LIST	LIST	LIST	LISS	+	+	+	+	+
13	+	+	+	+	+	+	MESS	+	+	+
14	+	+	+	+	+	+	+	+	+	+
15	+	+	+	+	+	+	+	+	+	+
16	LISS	+	+	+	+	U.S.	DOLESS	WES	WES	WES
17	+	+	+	+	DRESS	MESS	MESS	+	+	+
18	+	+	+	+	+	+	+	+	+	+
19	LIST	LIST	WEST	WEST	WEST	MASS	MESS	MESS	MESS	MESS
20	LIST	LIST	LIST	LIST	LIST	LIST	+	WRIST	LIST	DRESS
21	LIST	LIST	+	LIST	LIST	LIST	LIST	+	+	LIST
22	+	+	+	+	+	+	+	+	+	+
23	+	+	+	+	+	+	+	+	+	+
24	+	+	+	BLESS	BLESS	MESS	MESS	MESS	MESS	MESS
25	+	+	+	+	LIST	+	+	+	+	+
26	LISP	LISP	LISP	LIST	LISP	LISP	+	LISP	LISP	LISP
27	DIST	+	LIST	LIST	+	+	+	+	LIST	+
28	+	+	+	+	+	YES	YES	+	+	+
29	+	+	+	+	+	+	+	+	+	+
30	LIST	LIST	LIST	LIST	LIST	NEST	NEST	LIST	MESS	MET
31	LIST	LIST	LIST	LIST	LIST	LIST	LIST	LIST	LIST	LIST
32	+	+	LISS	+	+	LET	LET	LET	LET	LET
NUMBER CORRECT:	17	22	22	21	20	14	18	18	18	18

# Appendix F.

Subject Responses for the Speech Synthesized Word "Yet" in the Low Probability Sentence Condition.

SUBJECT	VOTRAX PRESENTATION NUMBER					ECHO PRESENTATION NUMBER				
	1	2	3	4	5	1	2	3	4	5
1	+	+	+	+	+	+	YIPS	YEPS	+	YES
2	+	+	+	+	+	+	+	+	+	+
3	+	+	+	+	+	+	YES	YES	YES	YES
4	+	+	+	+	+	YES	YES	YES	YES	YES
5	+	+	+	+	+	+	+	+	+	+
6	+	+	+	+	+	YES	YANZ	YANZ	YANZ	YANZ
7	+	+	+	+	+	YES	YES	YES	YES	YES
8	+	+	+	+	+	+	+	+	+	+
9	+	+	+	+	+	YES	+	+	+	+
10	+	+	+	+	+	YES	YES	YES	+	+
11	+	+	+	+	+	YES	YES	YES	YES	YES
12	+	+	+	+	+	+	+	+	+	+
13	+	+	+	+	+	+	+	+	+	+
14	+	+	+	+	+	+	+	YES	+	+
15	+	+	+	+	+	YES	+	+	+	+
16	+	+	+	+	+	+	+	+	YERT	+
17	NET	NET	NET	NET	NET	NET	NET	NET	MATH	+
18	+	+	+	+	+	+	+	+	+	+
19	+	+	+	+	+	YES	YES	YES	YES	YES
20	+	+	+	+	+	YES	+	YES	YES	+
21	+	+	+	+	+	+	YEPS	YEPS	YEPS	LETS
22	+	+	+	+	+	+	YES	+	+	+
23	+	+	+	+	+	+	+	+	+	+
24	NET	NET	NYET	NET	NYET	NYETCH	NUDGE	MYETCH	NYETCH	METCH
25	+	+	+	+	+	YES	+	+	+	+
26	NET	NET	NET	NET	NET	NERT	NERT	HURT	NERT	NERT
27	NYET	NYET	+	+	NYET	NYET	+	+	NYET	NYET
28	+	+	+	+	+	+	+	+	+	+
29	+	+	+	+	+	+	+	+	+	+
30	+	+	+	MET	+	MET	MET	MET	MET	MET
31	+	+	+	+	+	+	YES	YES	YES	+
32	+	+	+	+	+	+	+	+	+	+
NUMBER CORRECT:	28	28	29	28	28	17	17	16	17	20

Appendix F.

Subject Responses for the Speech Synthesized Word "Shirt" in the Low Probability Sentence Condition.

SUBJECT	VOTRAX PRESENTATION NUMBER					ECHO PRESENTATION NUMBER				
	1	2	3	4	5	1	2	3	4	5
1	+	+	+	+	+	FIRST	FIRST	ERPST	ERPST	ERPST
2	+	+	+	+	+	EARTH	EARTH	EARTH	EARTH	EARTH
3	+	+	+	+	+	FIRST	FIRST	FIRST	EARTH	ERST
4	+	+	+	+	+	N/R	FIRST	FIRST	N/R	FIRST
5	+	+	+	+	+	HURT	HURT	HURT	HURT	HURT
6	+	+	+	+	+	HERTZ	HERTZ	FIRST	HERTZ	FIRST
7	+	+	+	+	+	FIRST	BIRTH	BIRTH	EARTH	EARTH
8	+	+	+	+	+	HURT	HURT	+	HURT	+
9	+	+	+	+	+	VERB	VERB	VERB	FIRST	+
10	+	+	+	+	+	HER	HER	HER	HER	HER
11	+	+	+	+	+	FIRST	FIRST	FIRST	FIRST	FIRST
12	+	+	+	+	+	FIRST	BIRTH	FIRST	EARTH	EARTH
13	+	+	+	+	+	FIRST	FIRST	FIRST	FIRST	FIRST
14	+	+	+	+	+	SHIRTS	+	+	SHIRTS	+
15	+	+	+	+	+	HER	HURT	HER	HER	HER
16	+	+	+	+	+	EARTH	EARTH	ERT	ERT	ERT
17	+	+	+	+	+	+	+	+	+	+
18	+	+	+	+	+	+	+	+	+	+
19	+	+	+	+	+	EARTH	EARTH	EARTH	EARTH	EARTH
20	+	+	+	+	+	EARTH	BIRD	BIRD	BIRD	BURP
21	+	+	+	+	+	FIRST	FIRST	FIRST	ERPS	FIRST
22	+	+	+	+	+	ERCH	HURT	HURT	ERT	ERT
23	+	+	+	+	+	HURT	HURT	HURT	+	+
24	+	+	+	+	+	BIRCH	BIRCH	CHURCH	CHURCH	CHURCH
25	+	+	+	+	+	HER	HER	HER	HER	HER
26	+	+	+	+	+	HURT	HURT	HURT	HURT	HURT
27	+	+	+	+	+	MEAP	BERK	BURP	BURP	BERT
28	+	+	+	+	+	BERT	+	+	+	+
29	+	+	+	+	+	EARTH	HURT	HURT	HURT	HURT
30	+	+	+	+	+	HURT	HURT	+	+	+
31	+	+	+	+	+	HURT	HURT	BURP	BURP	HURT
32	+	+	+	+	+	BURP	BURP	BURP	BURNT	BURP
NUMBER										
CORRECT:	32	32	32	32	32	2	4	6	5	8



# Appendix F.

Subject Responses for the Speech Synthesized Word "Heard" in the Low Probability Sentence Condition.

SUBJECT	VOTRAX PRESENTATION NUMBER					ECHO PRESENTATION NUMBER				
	1	2	3	4	5	1	2	3	4	5
1	SHIRT	SHIRT	JURY	JURY	JURY	PERFECT	PERFECT	PERFECT	PERFECT	PERFECT
2	ERT	ERD	ERD	ERD	ERD	BIRTH	EARTH	EARTH	EARTH	FIRST
3	GIRL	GIRL	GIRL	GIRL	GIRL	HURRY	PRAY	PRAY	HURRY	PRAY
4	N/R	N/R	HURT	N/R	N/R	N/R	N/R	N/R	N/R	N/R
5	BIRD	YERD	+	YERD	+	+	HURRY	HURRY	HURRY	HURRY
6	HURRY	CARRY	CURRY	CARRY	CURRY	HURRY	HURRY	HURRY	HURRY	URRY
7	JURY	JURY	HURRY	HURRY	CHARITY	HURRY	HURRY	HURRY	HURRY	HURRY
8	+	+	+	+	SURE	PERG	BERG	PERK	PERK	PERK
9	CHARITY	CHARITY	CHARITY	CHARITY	CHARITY	HURRY	HURRY	HURRY	HURRY	HURRY
10	+	CHARITY	+	+	CURED	HER	HER	HURRY	HER	HURRY
11	JURY	JURY	JURY	JURY	JURY	VERDICT	VERDICT	FIRST	VERDICT	VERDICT
12	+	+	+	+	+	PERFECT	PERFECT	N/R	PERFECT	PERFECT
13	CARROT	CARROT	CARROT	CARROT	CARROT	FIRST	FIRST	FIRST	FIRST	FIRST
14	CURD	CURD	CURD	SHIRT	CURD	PERFECT	VERB	N/R	VERB	PERFECT
15	SHIRT	HURT	HURT	HURT	HURT	HER	HER	HER	HER	PERFECT
16	+	YERD	ERD	+	+	ERK	ERK	ERK	ERK	ERK
17	CHARITY	CHARITY	CHARITY	THERAPY	THERAPY	FUR	THERAPY	THERAPY	THERAPY	THERAPY
18	HURT	HURT	HURT	HURT	+	HURT	HURT	HURRY	HURRY	HURRY
19	BIRD	BIRD	BIRD	BIRD	BIRD	BIRD	BIRD	EARTH	EARTH	BIRD
20	CURD	BIRD	SHIRT	BIRD	CURB	BIRD	BIRD	BIRD	BURP	BIRD
21	ERG	ERT	N/R	SHIRT	SHIRTY	ERK	ERK	ERK	FIRT	FIRST
22	GERD	GERD	ERD	GERD	GERD	ERG	ERG	ERD	ERG	ERG
23	SHIRT	SHIRT	SHIRT	SHIRT	SHIRT	HURT	FUR	FUR	HURT	FUR
24	JURY	JURY	JURY	JURY	JURY	HURRY	HURRY	URRY	ER EE	HURRY
25	+	+	+	+	+	PERFECT	PERFECT	PERFECT	PERFECT	PERFECT
26	BIRD	BIRD	BIRD	BIRD	BIRD	BIRD	BIRD	BIRD	BIRD	BIRD
27	KERG	KERG	CURD	CURD	CURD	VERG	BERG	BERG	BERG	BERG
28	CURD	CURD	CURD	CURD	CURD	PERFECT	PERFECT	PERFECT	PERFECT	PERFECT
29	BIRD	+	BIRD	BIRD	+	EARTH	BIRD	BERG	BERG	BERG
30	THIRD	THIRD	THIRD	THIRD	THIRD	HURT	HURT	HURT	HURT	THIRD
31	HURRY	HURRY	SHIRT	SHIRT	JURY	HURRY	HURRY	HURRY	HURRY	HURRY
32	+	+	BIRD	HER	BIRD	PERFECT	PERFECT	PERFECT	PERFECT	PERFECT
NUMBER CORRECT:	6	5	5	5	6	1	0	0	0	0

# Appendix F.

Subject Responses for the Speech Synthesized Word "Notch" in the Low Probability Sentence Condition.

SUBJECT	VOTRAX PRESENTATION NUMBER					ECHO PRESENTATION NUMBER				
	1	2	3	4	5	1	2	3	4	5
1	MUCH	MUCH	MUCH	MUCH	MUCH	MUCH	MUCH	MUCH	MUCH	MUCH
2	N/R	LOTCH	LOTCH	WATCH	LOTCH	MA	MA	MA	MA	NOT
3	SUCH	MUCH	SUCH	N/R	SUCH	MUCH	MUCH	MUCH	MUCH	MUCH
4	WATCH	WATCH	WATCH	WATCH	WATCH	MUCH	MUCH	MUCH	MUCH	MUCH
5	BLOTCH	LUTCH	BLOTCH	WATCH	WATCH	MUCH	MUCH	MUCH	MUCH	NOT
6	LUTCH	LOTCH	LOTCH	LOTCH	LOTCH	MOTCH	MOTCH	MOTCH	MOTCH	MOTCH
7	+	+	LODGE	LODGE	LODGE	MATCH	MATCH	MATCH	MATCH	MATCH
8	MUCH	MUCH	MUCH	MUCH	WATCH	MUCH	MUCH	MUCH	MUCH	MUCH
9	LUP	LUNCH	LUNCH	LUNCH	LUNCH	MOP	MOP	MOP	MOP	MOP
10	LOTCH	LOTCH	LOTCH	LOTCH	LOTCH	MOTCH	MA	MINE	MUT	MUCH
11	LODGE	LODGE	LODGE	LODGE	LODGE	MATH	MATH	MAWLTCH	MULTCH	MAWLTCH
12	LARGE	LARGE	LARGE	LARGE	LARGE	MARCH	MARCH	MARCH	MARCH	MARCH
13	NOT	NOT	LOT	LOT	LOT	NOT	NOT	NOT	NOT	NOT
14	+	+	+	+	+	+	+	+	+	+
15	NOT	LOT	LIE	LAWT	LAWT	MUM	MA	MA	MUM	MA
16	WATCH	LOTCH	LOTCH	LOTCH	LOTCH	MUCH	MUCH	MUCH	MUCH	MOTCH
17	WATCH	+	+	+	+	MARCH	MARCH	MARCH	MARCH	MARCH
18	+	+	MUCH	+	+	MUCH	MUCH	MUCH	MUCH	MUCH
19	MUCH	MUCH	MUCH	MUCH	MUCH	MUCH	MUCH	MUCH	MUCH	MUCH
20	WATCH	WATCH	WATCH	WATCH	WATCH	MOTH	MOM	MOP	MOP	MOP
21	LOT	LOT	LOT	LOT	LOT	MUCH	MUCH	MUCH	MUCH	MUCH
22	+	+	LOTCH	LOTCH	LOTCH	MOTCH	MOTCH	MOTCH	MOTCH	MUCH
23	LOT	LOT	LOT	LOT	LOT	LOT	LOT	LOT	LOT	NOT
24	MOTCH	MOTCH	MOTCH	MOTCH	MOTCH	MOTCH	MOTCH	MOTCH	MOTCH	MOTCH
25	LOVE	LOT	LOT	LOT	LOT	MUM	MUM	MOM	MUM	MA
26	NUT	LOCKED	LOCKED	KNOCKED	NOT	MUCH	MUCH	MUCH	MUCH	MUCH
27	WATCH	MOTCH	LOTCH	LUTCH	WATCH	MOTCH	MOTCH	MOTCH	MOTCH	MUCH
28	LODGE	LODGE	+	LODGE	+	NOT	NOT	+	+	+
29	MARCH	MARCH	WATCH	WATCH	WATCH	MARCH	MARCH	MARCH	MARCH	MARCH
30	WATCH	WATCH	LUNCH	WATCH	WATCH	MARCH	MARCH	MARCH	MARCH	MARCH
31	LUCK	LOT	LOT	LOT	LOT	MUCH	MUCH	MUCH	MUCH	MUCH
32	WATCH	WATCH	WATCH	WATCH	WATCH	MOCK	MOCK	MIKE	MUCK	MOCK
NUMBER CORRECT:	4	5	3	3	4	1	1	2	2	2

Appendix F.

Subject Responses for the Speech Synthesized Word "Walk" in the Low Probability Sentence Condition.

SUBJECT	VOTRAX PRESENTATION NUMBER					ECHO PRESENTATION NUMBER				
	1	2	3	4	5	1	2	3	4	5
1	+	+	LOCK	+	+	WOLF	WOLF	WOLF	WOLF	WOLF
2	+	+	LAW	LOG	LOG	N/R	WAWLF	WAWLF	WAWLF	WAWLF
3	LAWT	LOT	LOT	LOT	LOT	WOLF	WOLF	WOLF	WOLF	WOLF
4	LOCK	LOCK	LAW	+	+	WAWLF	WALL	WOLF	WAWLF	WALL
5	LOT	LOT	LONG	LODGE	LONG	ONCE	+	+	+	+
6	LOCK	LOCK	LAW	LOCK	LOCK	N/R	+	WAW	WALKS	WONTH
7	LIE	LIE	LIE	LIE	LIE	LOFT	LOFT	LOFT	LOFT	LOFT
8	LOG	LOCK	LOCK	LOG	LOG	N/R	+	+	+	+
9	LOCK	LOG	LOCK	LOG	LOG	LAW	LALL	LULL	LULL	LULL
10	LOCK	LOCK	+	+	+	+	WALL	WALL	LONG	WALL
11	LIE	LIE	LIE	LIE	LIE	N/R	WIFE	WIFE	WIFE	MULT
12	LOCK	LOG	LAW	+	LAW	N/R	LOAF	WOLF	WOLF	WOLF
13	LOCK	LOCK	LOT	LOCK	LOCK	N/R	+	WARMTH	WARMTH	WARMTH
14	+	+	WAD	WAD	WAD	+	+	+	+	+
15	LAW	LOCK	LAW	LAWT	LAWK	WANT	WALL	WOCK	WA	+
16	LAWK	LOCK	+	+	+	WA	+	+	+	+
17	+	+	+	WALLET	+	ONCE	WALL	WALL	WALL	WALL
18	LOCK	LOCK	LOCK	+	+	ONE	+	+	+	+
19	+	LOG	LOG	LOG	LOG	LOVE	LOVE	LOVE	LOVE	LOVE
20	WATCH	+	+	WATCH	WATCH	+	+	+	+	+
21	LOT	LOT	LOT	LOT	LOT	WOLF	WOLF	WOLF	WOLF	WOLF
22	LOT	N/R	WA	WHY	+	+	+	+	+	+
23	LOT	LOT	LOT	LOT	LOT	+	+	+	+	+
24	JLALL	JLALL	LAW	BLODGE	SHLALL	WATCH	WALL	WALL	WALL	WALL
25	+	+	WALL	LOG	LOG	WALL	WALL	WALL	WALL	WALL
26	LOCK	LOCK	LOCK	LOCK	LOCK	WOLF	WOLF	WOLF	WOLF	WOLF
27	LOG	LOG	LUG	WOG	WOG	WA	WA	WA	WA	WALL
28	LOG	LOG	LOG	LOG	LOG	+	LOG	WOLF	WALL	LOG
29	LOT	LOT	+	+	+	N/R	+	WOFE	+	+
30	LOG	LOG	LOCK	LOG	LOG	+	LOOK	LOOK	LOOK	LOOK
31	LOT	LOT	LAW	LAW	LAW	PLEASE	WALL	+	WALL	+
32	LAWD	+	+	LOG	+	+	+	+	+	+
NUMBER CORRECT:	6	7	6	7	9	8	12	10	10	12

# Appendix F.

Subject Responses for the Speech Synthesized Word "Wall" in the Low Probability Condition.

SUBJECT	VOTRAX PRESENTATION NUMBER					ECHO PRESENTATION NUMBER				
	1	2	3	4	5	1	2	3	4	5
1	+	+	+	+	+	ONE	ONE	ONE	ONE	ONE
2	+	+	+	+	+	ONE	+	+	+	+
3	+	+	+	+	+	ROOM	WARM	ROOM	WARM	ROOM
4	+	+	+	+	+	+	+	+	+	+
5	+	+	+	+	+	WARM	WARM	WARM	WARM	WARM
6	LAW	+	+	+	+	ONE	ONE	ONE	ONE	ONE
7	LULL	+	+	+	+	GLUM	GLUM	GLUM	GLUM	GLUM
8	+	+	+	+	+	ONE	ONE	ONE	ONE	ONE
9	LULL	LULL	LULL	LULL	+	LONG	LULL	LULL	LULL	LULL
10	+	+	+	+	+	+	WAND	+	+	+
11	LULL	LULL	LULL	LULL	LULL	MUM	MUM	MOM	MUM	MUM
12	+	+	+	+	+	ONE	ONE	ONE	ONE	ONE
13	+	+	+	WAW	+	WOMB	WOMB	WOMB	WOMB	WOMB
14	+	+	+	+	+	+	+	+	+	+
15	+	+	+	+	+	+	+	+	+	+
16	+	+	+	+	+	WUM	WUM	WUM	WUM	WUM
17	+	+	+	+	+	WOMAN	WOMAN	WOMAN	WOMAN	WOMAN
18	LALL	+	+	+	+	ONE	ONE	ONE	ONE	ONE
19	+	+	+	+	+	+	+	+	+	+
20	+	+	+	+	+	MOM	LONG	MOM	WAM	WOMAN
21	LULL	LULL	LULL	LULL	LULL	ONE	WOLF	ONE	ONE	ONE
22	+	+	+	+	+	+	+	+	+	+
23	LAU	LAU	LAU	LAU	LAU	ONE	ONE	ONE	ONE	ONE
24	BLALL	BLALL	+	+	+	+	+	+	+	+
25	+	+	+	+	+	ONE	+	+	ONE	+
26	LULL	LULL	LULL	LULL	LULL	RUN	RUN	RUN	RUN	RUN
27	VOWEL	+	+	+	WULL	BUL	WULL	WULL	BUL	+
28	+	+	+	+	+	ONE	ONE	ONE	ONE	ONE
29	+	+	+	+	+	WARM	WARM	WARM	WARM	WARM
30	+	+	+	+	+	ONE	ONE	ONE	ONE	ONE
31	LULL	+	+	+	+	WARM	WARM	WARM	WARM	WARM
32	+	+	+	+	+	ONE	ONE	ONE	ONE	ONE

NUMBER										
CORRECT:	21	26	27	26	27	7	8	9	8	10

# Appendix F.

Subject Responses for the Speech Synthesized Word "Fog" in the Low Probability Sentence Condition.

SUBJECT	VOTRAX					ECHO				
	PRESENTATION NUMBER					PRESENTATION NUMBER				
	1	2	3	4	5	1	2	3	4	5
1	+	+	+	+	+	FINE	FINE	HI	HI	HI
2	LIGHT	LIGHT	LIFE	LIGHT	FIGHT	ON	ON	ON	ON	ON
3	LIGHT	LIGHT	LIGHT	BODY	BODY	N/R	HOBBY	HOBBY	HOBBY	HOBBY
4	N/R	N/R	N/R	N/R	N/R	N/R	N/R	N/R	N/R	N/R
5	FIRE	FIDE	BODY	BODY	BODY	HOBBY	HOBBY	HOBBY	HOBBY	HOBBY
6	I	FIE	FIE	FIE	FIE	SORRY	N/R	SORRY	SORRY	SORRY
7	SOGGY	SORRY	SORRY	FIRE	SORRY	HOBBY	HOBBY	HOBBY	HOBBY	HOBBY
8	SLY	SLY	SLY	SLY	SLY	HI	HI	HI	HI	HI
9	BODY	BODY	BODY	BODY	BODY	HOBBY	HOBBY	HOBBY	HOBBY	HOBBY
10	SORRY	SORRY	FLY	FILE	FIRE	SORRY	SORRY	SORRY	SORRY	SORRY
11	FIGHT	FIGHT	FIGHT	FIGHT	FIGHT	FOUNTAIN	FOUNTAIN	LIFE	FOUNTAIN	FOUNTAIN
12	ODD	ODD	ODD	ODD	ODD	ON	ON	ON	HARVEY	ABIE
13	+	+	+	+	+	HOBBY	HOBBY	HOBBY	HOBBY	HOBBY
14	SOD	SOD	SOD	SOD	SOD	N/R	N/R	N/R	N/R	N/R
15	FLY	HI	HI	BUY	HI	N/R	HAPPY	N/R	N/R	N/R
16	+	FIGHT	THIGH	FIE	FIE	APP	A	I	A	ONDREE
17	FAWB	FOUGHT	FOUGHT	FOUGHT	FOUGHT	MONEY	MONEY	MONEY	MONEY	MONEY
18	SLIDE	SLIDE	SLIDE	SLIDE	SLIDE	HAPPY	SORRY	SORRY	SORRY	HOBBY
19	BUG	BALL	LOG	FALL	+	OF	OF	OF	OF	LOVE
20	FALL	FOLLOW	FIGHT	FIGHT	BALL	MOM	MOM	MOP	MOM	BOMB
21	IFE	FIGHT	FIGHT	FIGHT	FALL	UG	A	UG	UG	N/R
22	VIE	VIE	FIE	FIE	FIE	UM	I	I	I	AB
23	SIGH	SIGH	SIGH	SIGH	SIGH	WHAT	LAB	HOBBY	HOBBY	HOBBY
24	JULY	JULY	JULY	JULY	JULA EE	A EE	A EE	HOBBY	HOBBY	HOBBY
25	LIGHT	LIGHT	LIGHT	LIGHT	LIGHT	I	I	I	I	I
26	SOD	SOD	SOD	SOD	SOD	ON	FUN	FUN	FUN	FUN
27	FROG	+	+	FROG	+	UPEE	UBEE	UPEE	I ME	FIVE
28	+	+	+	+	+	SORRY	SORRY	SORRY	SORRY	SORRY
29	ODD	ODD	ODD	ODD	ODD	ARM	ARM	ARM	ARM	ARM
30	+	+	+	+	+	COFFEE	COFFEE	COFFEE	COFFEE	COFFEE
31	SLIDE	SLIDE	SLIDE	SLIDE	SLIDE	PUPPY	HAPPY	HONEST	HAPPY	HURRY
32	SADEE	SORRY	SORRY	SADEE	SORRY	N/R	SODVEE	SORRY	MAVEE	MAVEE

NUMBER

CORRECT: 5 5 5 4 6 0 0 0 0 0

# Appendix F.

Subject Responses for the Speech Synthesized Word "Moon" in the Low Probability Sentence Condition.

SUBJECT	VOTRAX PRESENTATION NUMBER					ECHO PRESENTATION NUMBER				
	1	2	3	4	5	1	2	3	4	5
1	+	+	+	+	+	LOON	LOON	LOOM	LOON	LOON
2	LOON	+	+	+	+	LOON	LOON	LOON	LOON	LOON
3	+	+	+	+	+	+	LOOM	ROOM	NOON	LOON
4	+	WOUND	WOUND	N/R	N/R	LOON	LOON	LOON	LOON	LOON
5	+	+	+	+	+	LOON	LOON	LOON	LOON	LOON
6	+	+	+	+	+	LOON	LOON	LOON	NOON	LOON
7	+	+	+	+	+	LOON	LOON	LOON	LOON	LOON
8	+	+	+	+	+	LOON	LOON	LOOM	LOON	LOON
9	+	+	+	+	+	LOOM	LOOM	LOOM	LOON	LOOM
10	+	+	+	+	+	LOON	LOON	LOON	LOON	LOON
11	+	+	+	+	+	LOON	LOON	LOON	LOON	LOON
12	+	+	+	+	+	NOON	NOON	NOON	NOON	NOON
13	+	+	+	+	+	LOON	LOON	LOON	LOON	LOON
14	+	+	+	+	+	LOON	LOON	LOON	LOON	LOON
15	+	+	+	+	+	LOON	LOON	LOON	LOON	LOON
16	+	+	+	+	+	LOON	LOON	+	LOON	LOON
17	+	NOON	+	+	+	+	+	LOON	LOON	LOON
18	+	+	+	+	+	LOOM	LOOM	LOOM	LOOM	LOOM
19	+	+	+	+	+	+	+	+	+	+
20	+	+	+	+	+	LOON	LOON	LOON	LOON	LOON
21	+	+	+	+	+	NOON	NOON	NOON	NOON	NOON
22	+	+	+	+	+	LOON	LOON	LOON	LOON	LOON
23	+	+	+	+	+	LOON	LOON	LOON	LOON	LOON
24	+	+	+	+	+	+	LOON	LOON	LOON	LOON
25	+	+	+	+	+	LOON	LOON	LOON	LOON	LOON
26	+	+	+	+	+	LOON	LOON	LOON	LOON	LOON
27	MOOM	MOOM	+	MOOM	+	LOOM	LOOM	LOOM	LOON	LOOP
28	+	+	+	+	+	LOON	LOON	LOON	LOON	LOON
29	+	+	+	+	+	NOON	NOON	LOON	LOON	NOON
30	+	+	+	+	+	LOON	LOON	LOON	LOON	LOON
31	+	ROOM	+	+	+	LOON	LOON	LOON	LOON	LOON
32	+	+	+	+	+	LOON	LOON	LOON	LOON	LOON
NUMBER CORRECT:	30	28	31	30	31	4	2	2	1	1

Appendix F.

Subject Responses for the Speech Synthesized Word "Jews" in the Low Probability Sentence Condition.

SUBJECT	VOTRAX PRESENTATION NUMBER					ECHO PRESENTATION NUMBER				
	1	2	3	4	5	1	2	3	4	5
1	JEWELS	JEWELS	JEWELS	JEWELS	JEWELS	JUICE	JEWELS	JEWELS	JEWELS	JEWELS
2	+	+	+	+	+	+	+	+	+	+
3	JEWELS	CHOOSE	CHOOSE	CHOOSE	CHOOSE	CHOOSE	CHOOSE	CHOOSE	CHOOSE	CHOOSE
4	JUICE	JUICE	JUICE	JUICE	JUICE	JUICE	JUICE	JUICE	JUICE	JUICE
5	SHOES	CHOOSE	CHOOSE	CHOOSE	CHOOSE	CHOOSE	CHOOSE	CHOOSE	JUICE	SHOES
6	JUICE	+	+	+	+	JUICE	+	+	+	+
7	JEWELS	JEWELS	JEWELS	JEWELS	JEWELS	LISTEN	JULIUS	JULIUS	JULIUS	JULIUS
8	+	+	+	+	+	JUDAS	JEWELS	JUDAS	+	JUDAS
9	+	+	+	+	+	+	+	+	+	+
10	JEWELS	JEWELS	JEWELS	JEWELS	JEWELS	JEWELS	JEWELS	JULIS	JULIS	JULIS
11	JEWELS	JEWELS	JEWELS	JEWELS	JEWELS	JEWELS	JEWELS	JEWELS	JEWELS	JEWELS
12	JEWELS	JEWELS	JEWELS	JEWELS	JEWELS	JULIUS	JULIUS	JULIUS	JULIUS	JULIUS
13	JUICE	JEWELS	+	JEWELS	JEWELS	JUICE	JUICE	JUICE	JUICE	JUICE
14	JEWELS	JEWELS	JEWELS	JEWELS	JEWELS	JULIE'S	JULIE'S	JULIE'S	JULIE'S	JULIE'S
15	+	+	+	+	CHOOSE	CHOOSE	JUICE	+	+	CHOOSE
16	+	+	+	+	+	JUICE	JUICE	JUICE	JEWELS	JEWELS
17	JEWELS	JEWELS	JEWELS	JEWELS	JEWELS	JUICE	JEWELS	JEWELS	JEWELS	JEWELS
18	+	+	+	+	+	+	+	+	+	+
19	JUICE	JUICE	JUICE	JUICE	JUICE	JUICE	JUICE	JUICE	JUICE	JUICE
20	JEWELS	JEWELS	JEWELS	JEWELS	JEWELS	JEWELS	JEWELS	JEWELS	JEWELS	JEWELS
21	JUDAS	JUDAS	JUDAS	JUDAS	JUDAS	JUDAS	JUDAS	JUDAS	JUDAS	JUDAS
22	JEWELS	JEWELS	JEWELS	JEWELS	JEWELS	JEWELUS	JEWELUS	JEWELUS	JEWELUS	JEWELUS
23	+	+	+	+	+	+	+	+	+	+
24	+	+	+	+	+	JUICE	JUICE	+	+	+
25	JEWELS	JEWELS	JEWELS	JEWELS	JEWELS	JULIUS	JULIUS	JULIUS	JULIUS	JULIUS
26	JEWELS	JEWELS	JEWELS	JEWELS	JEWELS	JUICE	JUICE	JUICE	JUICE	JUICE
27	JUICE	JUICE	JUICE	JUICE	JUICE	JUICE	JUICE	JUICE	JUICE	JUICE
28	JEWELS	JEWELS	JEWELS	JEWELS	JEWELS	JEWELS	JEWELS	JEWELS	JEWELS	JEWELS
29	+	+	+	+	+	+	+	+	+	+
30	JUICE	JUICE	JUICE	JUICE	+	JUICE	JUICE	JUICE	JUICE	JUICE
31	JUICE	JUICE	JUICE	JUICE	JUICE	JUICE	JUICE	+	JUICE	JUICE
32	JUNE	JUNE	JUNE	JUNE	JUNE	JULIE'S	JULIE'S	JULIE'S	JULIE'S	JULIE'S
NUMBER CORRECT:	9	10	11	10	10	5	6	9	9	7

Appendix F.

Subject Responses for the Speech Synthesized Word "Sing" in the Low Probability Sentence Condition.

SUBJECT	VOTRAX PRESENTATION NUMBER					ECHO PRESENTATION NUMBER				
	1	2	3	4	5	1	2	3	4	5
1	SIN	SIN	SIN	SIN	SIN	SIN	SIN	SIN	SI	SIN
2	SIN	SIN	ZIN	SIN	ZIN	ZIM	ZIN	ZIN	ZIN	ZIN
3	SIN	SIN	SIN	SIN	SIN	SIN	WOMEN	SIN	WOMEN	WOMEN
4	SIN	SIN	SIN	SIN	SIN	SIN	SIN	SIN	+	SIN
5	SIN	SIN	SIN	SIN	SIN	SIN	SIN	SIN	HIM	SIN
6	ZIN	ZIN	ZIN	SIN	SIN	ZIN	SIN	SIN	SIN	ZIN
7	SIN	SIN	SIN	ZIN	SIN	SIN	SIN	ZIN	SIN	SIN
8	SIN	SIN	SIN	SIN	SIN	SIN	SIN	SIN	SIN	SIN
9	SIN	SIN	SIN	SIN	SIN	SIN	SIN	SIN	THIN	THIN
10	SELL	SELL	SELL	SELL	SELL	HIM	HIM	HIM	HIM	HIM
11	SIN	SELL	SIN	SIN	SIN	FUME	FUME	FUME	FUME	FUME
12	ZIN	IN	IN	ZIN	IN	ZIN	THIN	THIN	IN	IN
13	SIN	SIN	SIN	SIN	SIN	SWIM	SIN	SIN	SWIM	SIN
14	SIN	SIN	SIN	SIN	SIN	SIM	SIM	SIM	SIM	SIN
15	SIN	SIN	SIN	SIN	+	HIM	HIM	HIM	HIM	HIM
16	SIN	ZIN	SIN	ZIN	SIN	SIM	SIN	SIN	SIN	SIN
17	THIN	THIN	SIN	SIN	THIN	THIN	THIN	THIN	THIN	THIN
18	SIN	SIN	SIN	SIN	SIN	SIN	SIN	SIN	SIN	SIN
19	SIN	SIN	SIN	SIN	SIN	SIN	SIN	SIN	SIN	SIN
20	SIN	SIN	SIN	SIN	SIN	SIN	SIN	SID	SIN	SIN
21	SIN	SIN	SIN	+	SIN	SIN	SIN	SIN	SIN	SIN
22	SILL	SILL	SILL	SILL	SILL	SIM	SIM	SIM	SIM	SIM
23	SIN	SIN	SIN	SIN	SIN	SIN	SIN	SIN	SIN	SIN
24	ZIN	ZIN	ZIN	ZIN	ZIN	ZIN	ZIN	ZIM	ZIM	IM
25	SIN	SIN	SIN	SIN	SIN	SIN	SIN	SIN	SIN	SIN
26	SIN	SIN	SIN	SIN	SIN	SIN	SIN	SIN	SIN	SIN
27	ZIN	ZIN	ZIN	SIN	ZIN	ZIM	ZIM	ZIN	ZIM	ZIM
28	SIN	SIN	SIN	SIN	SIN	SIN	SIN	SIN	SIN	SIN
29	SIN	SIN	SIN	SIN	SIN	SIN	SIN	SIN	SIN	SIN
30	SIN	SIN	IN	SIN	SIN	IN	SIN	SIN	SIN	SIN
31	SIN	SIN	SIN	SIN	SIN	SIN	HIM	SIN	HIM	HIM
32	SIN	SIN	SIN	SIN	SIN	BIM	BIM	BIN	BIM	BIM

NUMBER										
CORRECT:	0	0	0	1	1	0	0	0	1	0



# Appendix F.

Subject Responses for the Speech Synthesized Word "Thin" in the Low Probability Sentence Condition.

SUBJECT	VOTRAX PRESENTATION NUMBER					ECHO PRESENTATION NUMBER				
	1	2	3	4	5	1	2	3	4	5
1	SIN	SIN	SIN	+	IN	SIN	SIN	SIN	SIN	SIN
2	SIN	SIN	SIN	ZIN	ZIN	ZIM	ZIM	ZIM	ZIN	ZIM
3	SIN	FIN	+	SIN	+	SIN	SWIM	WOMEN	WOMEN	WOMEN
4	+	+	+	+	+	+	+	+	+	+
5	SIN	IN	SIN	SIN	SIN	SIM	HIM	HIM	HIM	HIM
6	ZIN	ZIN	ZIN	ZIN	ZIN	+	+	+	+	+
7	ZIN	ZIN	ZIN	ZIN	IN	SIN	+	+	+	+
8	+	+	+	+	+	+	+	+	+	+
9	SIN	SIN	SIN	SIN	SIN	+	+	+	+	+
10	SELL	SELL	SELL	SELL	SELL	HIM	HIM	HIM	HIM	HIM
11	SIN	SELL	SIN	SIN	SIN	FUME	FUME	FUME	FUME	FUME
12	ZIN	ZIN	IN	IN	IN	ZIN	ZIN	+	+	IN
13	+	+	+	+	+	SWIM	SWIM	SWIM	+	SWIM
14	ZIN	ZIN	IN	IN	IN	SIM	SIN	SIM	SIN	SIN
15	SING	SING	SING	SING	SIN	HIM	HIM	HIM	HIM	HIM
16	ZING	ZIN	ZIN	ZIN	ZIN	SIM	+	+	+	+
17	+	+	+	+	+	+	+	+	+	+
18	SIN	SIN	SIN	SIN	SIN	SIN	+	+	+	+
19	SIN	+	+	SIN	+	SIN	SIN	+	SIN	SIN
20	SIN	SIN	+	SIN	+	SIN	SIN	+	+	+
21	+	+	+	+	+	+	+	+	+	+
22	SILL	SILL	SILL	SILL	SILL	BIM	BIM	FIM	FIM	DIM
23	SIN	SIN	SIN	SIN	SIN	SIN	+	+	+	+
24	ZIN	ZIN	ZIN	ZIN	ZIN	IM	IM	IM	IM	IM
25	SIN	SIN	SIN	SIN	SIN	SIN	SIN	+	SIN	THIN
26	SIN	SIN	SIN	SIN	SIN	+	+	+	+	+
27	ZIN	ZIM	ZIN	ZIN	ZIN	SIN	ZIM	ZIM	SIM	ZIM
28	SIN	SIN	SIN	SIN	+	+	+	+	+	+
29	SIN	SIN	SIN	SIN	SIN	SIN	SIN	SIN	SIN	+
30	SIN	SIN	SIN	SIN	SIN	IN	IN	SIN	SIN	SIN
31	SIN	SIN	SIN	SIN	SIN	HIM	HIM	HIM	HIM	HIM
32	SIN	SIN	SIN	ZIN	SIN	BIN	BIM	BIM	BIM	BIN
NUMBER CORRECT:	5	6	8	6	9	8	12	16	15	14

Appendix F.

Subject Responses for the Speech Synthesized Word "Wrath" in the Low Probability Sentence Condition.

SUBJECT	VOYRAX PRESENTATION NUMBER					ECHO PRESENTATION NUMBER				
	1	2	3	4	5	1	2	3	4	5
1	LAST	LESS	LESS	REST	REST	RASS	LAST	LESS	LESS	REST
2	RESS	RAT	REST	RAT	REST	LESS	LESS	LESS	LESS	LESS
3	REST	REST	REST	REST	REST	RAT	REST	REST	REST	REST
4	REST	REST	REST	REST	REST	MESS	MESS	MESS	N/R	MESS
5	REST	RED	REST	REST	REST	REST	RESS	RESS	REST	REST
6	RESS	RESS	RESS	RESS	RASS	+	+	RANTH	+	+
7	REST	REST	REST	REST	REST	MASK	RAFT	MATH	MATH	MASK
8	REST	REST	REST	REST	REST	REST	REST	DRESS	REST	REST
9	HURRASS	HURRASS	HURRASS	HURRASS	HURRASS	MAP	RAT	MAT	RAT	MAT
10	REST	DRESS	DRESS	DRESS	RASP	RASP	RASP	RASP	DRESS	RASP
11	RAZ	RED	REST	REST	REST	MATH	MAT	MATH	MATCH	MATCH
12	REST	REST	REST	REST	REST	MATH	MATH	MATH	MATH	MATH
13	RAT	RAT	RAT	RAT	RAT	MATH	RAT	MASK	MASK	+
14	REST	REST	REST	REST	REST	REST	RASS	RASS	REST	RASS
15	REST	REST	REST	REST	REST	RAT	RAT	RAT	WRAP	RAT
16	RASS	RESS	RESS	RASS	RASS	MATH	MATH	MATH	MATH	MATH
17	DRESS	DRESS	DRESS	DRESS	DRESS	RAFT	RAFT	RAFT	RAFT	RAFT
18	REST	REST	REST	REST	REST	REST	REST	REST	REST	REST
19	REST	REST	REST	REST	REST	WRAP	MASS	MASS	MASS	REST
20	REST	DRESS	REST	REST	REST	LEFT	DRESS	MAN	DRESS	DRESS
21	LESS	YET	LIST	YET	REST	MESS	MESS	LESS	MESS	MESS
22	RESS	RESS	RESS	RESS	RESS	MATH	MATH	MATH	MATH	MATH
23	REST	REST	REST	REST	REST	LESS	LESS	LESS	LESS	LESS
24	DRESS	DRESS	DRESS	DRESS	DRESS	MATCH	MATCH	MATCH	MATCH	MATCH
25	REST	REST	REST	REST	REST	MESS	MESS	MESS	MESS	MESS
26	RASP	RASP	RASP	RASP	RASP	MATH	MATH	MATH	MATH	MATH
27	RESS	REST	REST	REST	REST	RASS	RASP	RESS	RASP	RASS
28	RAZ	RASS	BRASS	RASS	RASS	RAT	RAZ	RAT	WRAP	WRAP
29	REST	REST	REST	REST	REST	MESS	MESS	MESS	MESS	MESS
30	LIST	DRESS	DRESS	DRESS	DRESS	MASK	MASK	MASK	MASK	MASK
31	REST	REST	REST	REST	REST	RAFT	RAFT	RAFT	RAT	RAFT
32	RET	DRESS	RAT	RAT	WET	MAT	MAT	MAT	MAT	MAT
NUMBER										
CORRECT:	0	0	0	0	0	1	1	0	1	2

# Appendix F.

Subject Responses for the Speech Synthesized Word "Bat" in the Low Probability Sentence Condition.

SUBJECT	VOTRAX PRESENTATION NUMBER					ECHO PRESENTATION NUMBER				
	1	2	3	4	5	1	2	3	4	5
1	BLED	BET	BET	BET	ET	LAPS	MAPS	LAPS	LAPS	LAPS
2	THAT	THAT	THAT	THAT	THAT	MAT	MAT	MAT	MAT	MAT
3	LET	LET	LET	LET	LET	LESS	MASS	MASS	MASS	MAPS
4	+	BET	BET	BET	BET	MATCH	MATCH	MATCH	MATCH	N/R
5	BET	BET	BET	BET	BET	MET	MAT	MAT	MAT	MAT
6	BET	BET	BET	+	BET	MAPS	MATS	MATS	MAPS	MAPS
7	BEST	MET	BET	BET	BIT	MATCH	MATCH	MATCH	MATCH	MATCH
8	BET	BET	BET	BET	BET	MAT	MAT	MAT	MAT	MATCH
9	THAT	+	THAT	THAT	THAT	LAT	MAT	AT	MAT	MAT
10	THAT	THAT	THAT	THAT	THAT	MAT	MATCH	MAT	MAT	MAT
11	+	+	+	BET	BET	MAT	MAT	MAT	MATCH	MATCH
12	THAT	N/R	THAT	BET	BET	MAT	MAT	MAT	MAT	MATH
13	+	+	THAT	+	THAT	MAPS	MAPS	MAPS	MAPS	MAPS
14	THAT	THAT	THAT	+	BET	MAPS	MAPS	MAPS	MAPS	MAPS
15	THAT	THAT	LET	THAT	THAT	MAP	MAT	LET	MAT	MA
16	+	+	+	+	+	MAT	MAT	MAT	MAT	MAT
17	BETH	BET	BET	BET	BET	MAT	MAT	MATH	MATH	MAT
18	BET	BET	BET	BET	BET	MATCH	MATCH	MATCH	MATCH	MAT
19	BET	BED	BED	BED	BED	MAPS	MAPS	MAPS	MAPS	MAPS
20	BET	BET	BET	BET	BET	MAN	MAN	MAN	MAN	MAN
21	LET	LET	LET	LET	LET	MAPS	MAPS	MAPS	MAPS	MAPS
22	BET	BET	BET	BET	BET	MATCH	MATCH	MATCH	MATCH	MATCH
23	LET	LET	LET	LET	LET	LET	LET	LET	LET	LET
24	MET	ET	ET	MET	MET	MATCH	MATCH	MATCH	MATCH	MATCH
25	LET	LET	LET	LET	LET	MAP	MAP	MAT	MAT	MAT
26	BET	+	+	+	+	MAT	MAT	MAT	MAT	MAT
27	BET	BET	BET	BET	BET	MET	MAT	MET	MOT	MET
28	+	+	+	+	BET	MAT	MAT	MAT	MAT	MAT
29	BET	BET	BET	BET	BET	MAT	MAT	MAT	MAT	MAT
30	THAT	THAT	THAT	BET	BET	MAT	MET	MAT	MAT	MAT
31	+	GET	GET	GET	BET	LAST	LAPSE	MAP	MAP	MAP
32	BET	BET	BET	BET	BET	MAT	MAT	MAT	MAT	MAT
NUMBER CORRECT:	6	6	4	6	2	0	0	0	0	0

Appendix F.

Subject Responses for the Speech Synthesized Word "Wife" in the Low Probability Sentence Condition.

SUBJECT	VOTRAX PRESENTATION NUMBER					ECHO PRESENTATION NUMBER				
	1	2	3	4	5	1	2	3	4	5
1	LIFE	LIFE	LIFE	+	+	+	+	+	+	+
2	LIFE	LIFE	LIFE	LIFE	LIFE	LIFE	LIFE	LIFE	LIFE	+
3	LIFE	LIFE	LIFE	LIFE	LIFE	+	+	+	+	+
4	+	+	+	+	+	+	+	+	+	+
5	LIFE	LIFE	LIFE	LIFE	LIFE	+	+	+	+	+
6	LIFE	LIFE	LIFE	LIFE	LIFE	+	+	+	+	+
7	LIFE	LIFE	LIFE	LIFE	LIGHT	+	+	+	+	+
8	LIFE	LIFE	LIFE	LIFE	LIFE	+	+	+	+	+
9	LIFE	LIFE	LIFE	LIFE	LIFE	+	LIFE	LIGHT	LATE	WHITE
10	LIFE	LIFE	LIFE	LIFE	LIFE	LIFE	LIFE	LIFE	LIFE	LIFE
11	LIES	LIES	LIFE	LIES	LIFE	+	+	+	+	+
12	LIFE	LIFE	LIFE	LIFE	LIFE	LIFE	+	+	LIFE	LIFE
13	LIFE	LIFE	LIFE	LIFE	LIFE	+	+	+	+	+
14	+	+	+	+	+	+	+	+	+	+
15	LIFE	LIFE	LIFE	LIFE	LIFE	+	+	+	+	+
16	WIKE	WIKE	WIKE	WIKE	WIKE	+	+	+	+	+
17	LIFE	LIFE	+	LIFE	LIFE	+	KNIFE	+	+	+
18	LIES	LIES	LIES	LIFE	LIES	+	+	+	+	+
19	LIFE	LIFE	LIFE	LIFE	LIFE	LIFE	LIFE	LIFE	LIFE	LIFE
20	+	+	+	+	+	+	+	+	+	+
21	LIFE	LIFE	LIFE	LIFE	LIFE	+	+	+	+	+
22	LIFE	+	+	+	+	+	+	+	+	+
23	LIFE	LIFE	LIFE	LIFE	LIFE	LIFE	LIFE	LIFE	LIFE	LIFE
24	LIES	LICE	LICE	LIES	LICE	WI	WI	WI	WI	WI
25	+	LIFE	LIFE	LIFE	LIFE	+	+	+	+	+
26	LIFE	LIFE	LIFE	LIFE	LIFE	+	+	+	+	+
27	LIFE	LIFE	LIFE	LIFE	+	LIFE	LIFE	LIFE	LIFE	LIFE
28	LIFE	LIFE	LIFE	LIFE	LIFE	LIFE	LIFE	LIFE	LIFE	LIFE
29	LIFE	LIFE	+	+	+	+	+	+	+	+
30	LICE	LICE	LICE	LICE	LICE	LIGHT	LIGHT	MICE	LIGHT	LICE
31	LICE	LICE	LICE	LICE	LIFE	+	+	+	WHITE	+
32	+	+	LIFE	+	+	+	+	+	+	+
NUMBER CORRECT:	5	5	6	7	8	23	22	23	21	24

# Appendix F.

Subject Responses for the Speech Synthesized Word "Night" in the Low Probability Sentence Condition.

SUBJECT	VOTRAX PRESENTATION NUMBER					ECHO PRESENTATION NUMBER				
	1	2	3	4	5	1	2	3	4	5
1	LIGHT	LIGHT	LIGHT	LIGHT	LIGHT	LIGHTS	LIGHT	LIGHTS	LIGHT	LIGHT
2	LIGHT	LIGHT	LIGHT	LIGHT	LIGHT	+	LIGHT	LIGHT	LIGHT	LIGHT
3	LIGHT	LIGHT	LIGHT	LIGHT	LIGHT	MIGHT	MIGHT	LIGHTS	LIGHT	MIGHT
4	WHITE	WHITE	WHITE	WHITE	WHITE	LIGHT	LIGHT	LIGHT	LIGHT	LIGHT
5	LIGHT	LIGHT	LIGHT	LIGHT	LIGHT	LIGHT	MIGHT	MIGHT	LIGHT	LIGHT
6	LIGHT	LIGHT	LIGHT	LIGHT	LIGHT	MIGHT	MIGHT	MIGHTS	MIGHT	MITHE
7	LIGHT	LIGHT	LIGHT	LIGHT	LIGHT	LIGHT	MIGHT	+	MIGHT	MIGHT
8	LIGHT	LIGHT	LIGHT	LIGHT	LIGHT	MIGHT	MIGHT	MIGHT	MIGHT	MIGHT
9	LIGHT	LIGHT	LIGHT	LIGHT	LIGHT	LATE	LATE	LATE	LATE	LATE
10	LIGHT	LIGHT	LIGHT	LIGHT	LIGHT	MATE	MATE	MATE	MATE	MATE
11	LIGHT	LIGHT	LIGHT	LIGHT	LIGHT	LIFE	MAWLCH	MAWLCH	LIGHT	LIGHT
12	LIGHT	LIGHT	LIGHT	LIGHT	LIGHT	LIGHT	LIGHT	LIGHT	LIGHT	LIGHT
13	LIGHT	LIGHT	LIGHT	N/R	LIGHT	+	+	+	LIGHT	+
14	LIGHT	LIGHT	LIGHT	LIGHT	LIGHT	MIGHT	LIGHT	MIGHT	MIGHT	MIGHT
15	LIGHT	LIGHT	LIGHT	LIGHT	LIGHT	MY	LIGHT	MIGHT	MIGHT	MIGHT
16	LIGHT	LIGHT	LIGHT	LIGHT	LIGHT	MIGHT	MIGHT	MIGHT	MIGHT	MIGHT
17	+	+	LIGHT	+	+	MATE	MATE	MATE	MATE	MATE
18	LIGHT	LIGHT	LIGHT	LIGHT	LIGHT	MIGHT	MIGHT	MIGHT	MIGHT	MIGHT
19	LIGHT	LIGHT	LIGHT	LIGHT	LIGHT	LIGHT	LIGHT	LIGHT	LIGHT	LIGHT
20	LIGHT	WHITE	WHITE	WHITE	WHITE	LIGHT	LIGHT	LIFE	LIGHT	LIGHT
21	LIGHT	LIGHT	LIGHT	LIGHT	LIGHT	MIGHT	PIPES	PIPES	PIPES	PIPES
22	LIGHT	LIGHT	LIGHT	LIGHT	LIGHT	LIGHT	LIGHT	MIGHT	LIGHT	LIGHT
23	LIGHT	LIGHT	LIGHT	LIGHT	LIGHT	LIGHT	LIGHT	LIGHT	LIGHT	LIGHT
24	LIGHT	LIGHT	LIGHT	LIGHT	MIGHT	MAITCH	MAITCH	MAITCH	MAITCH	MAITCH
25	LIGHT	LIGHT	LIGHT	LIGHT	LIGHT	LIGHT	LIGHT	LIGHT	LIGHT	LIGHT
26	+	+	+	+	+	+	MATE	MATE	+	+
27	LIGHT	LIGHT	LIGHT	LIGHT	LIGHT	LIGHT	LIGHT	LIGHT	LIGHT	LIGHT
28	LIGHT	LIGHT	LIGHT	LIGHT	LIGHT	+	+	+	LIGHT	+
29	LIGHT	LIGHT	LIGHT	LIGHT	LIGHT	MIGHT	MIGHT	MIGHT	MIGHT	MIGHT
30	LIGHT	LIGHT	LIGHT	LIGHT	LIGHT	MIGHT	MIGHT	MIGHT	MIGHT	MIGHT
31	LIGHT	LIGHT	LIGHT	LIGHT	LIGHT	LIGHT	LICE	MIGHT	LIGHT	LIFE
32	LIGHT	LIGHT	WHITE	WHITE	WHITE	MIGHT	MIGHT	MIGHT	MIKE	MIGHT

NUMBER  
CORRECT:

2 2 1 2 2 4 2 3 1 3

Appendix F.

Subject Responses for the Speech Synthesized Word "Lab" in the Low Probability Sentence Condition.

SUBJECT	VOTRAX PRESENTATION NUMBER					ECHO PRESENTATION NUMBER				
	1	2	3	4	5	1	2	3	4	5
1	BLES	BLIP	BLIP	BLIP	BLIP	U APP	U AT	U APP	U AT	U APP
2	LED	LED	LED	LED	LED	LAT	LAT	LAT	LAT	LAT
3	LET	LEND	LEND	LEND	LEND	MAP	MAP	MAP	MAP	MAP
4	N/R	N/R	LAD	LED	LED	N/R	N/R	N/R	N/R	N/R
5	LEP	BLED	BLED	LED	LED	LAST	LAT	+	+	LAT
6	LELL	LED	LED	LED	LED	LA	LA	LANT	LAMP	LA
7	WELL	WELL	WELL	WELL	WELL	MAN	MAN	MAN	MAN	MAN
8	LEB	LEB	LEDGE	LEB	LEB	MAP	MAP	MAP	MAP	MAP
9	LED	LAD	LAD	LAD	ALAD	LAST	LAT	LAP	LATIN	LAT
10	LELL	LEB	LEB	BLAB	GLAD	LAT	LAP	LAP	LAP	THAT
11	GLAD	LAD	LED	LED	LED	MAT	MAT	MAT	MAT	MAT
12	LAD	LAD	LAD	LED	+	MAN	AT	MAN	AT	MAN
13	+	GLAD	+	+	+	NET	MAT	MAP	MAP	MAT
14	LED	LED	LED	LEB	LABEL	LA	LAP	LAP	LAP	LAP
15	LESS	LEB	LABEL	LEB	LAPE	LET	LET	LE	LET	LET
16	+	+	+	+	+	WA	MAT	MET	MET	MAT
17	+	+	+	+	+	+	MAT	MATH	+	MATH
18	LET	LET	LET	GLAD	GLAD	AT	LET	LET	LET	LET
19	WEB	WEB	WEB	WEB	WEB	MAP	MAP	MAP	MAP	MAP
20	RED	RED	RED	RED	RED	MAN	MAN	MAN	MAN	MAN
21	LET	LET	YET	LET	LEB	LET	LET	LET	LET	LET
22	WEB	LEB	LEB	WEB	LEB	MA	MA	MA	MAP	MAP
23	LET	LET	LET	LET	LET	LET	LET	LET	LET	LET
24	LEVEL	BLEBBLE	BLEBBLE	BLEBBLE	BLEBBLE	MA	MA	MA	MA	ME
25	LET	LET	EBB	EBB	EBB	LET	LET	LET	LET	LET
26	+	+	+	+	+	MAT	MAP	MAT	MAT	LAP
27	LEB	+	+	LAP	RAB	LET	LAP	LAP	LAP	+
28	+	+	+	+	+	LAP	LAP	LAP	LAP	HAT
29	+	+	+	+	+	MAT	MAT	MAT	MA	MA
30	LED	LED	+	+	+	MAT	MET	+	MET	NET
31	LENSE	GLAD	GLIB	GLAD	LAMP	LAST	LAST	LAST	LAST	THAT
32	LEB	WEB	WEB	WEB	WEB	LET	MAT	MAT	MAT	MAT
NUMBER CORRECT:	6	6	8	7	8	1	0	2	2	1

# Appendix F.

Subject Responses for the Speech Synthesized Word "Cat" in the Low Probability Sentence Condition.

SUBJECT	VOTRAX PRESENTATION NUMBER					ECHO PRESENTATION NUMBER				
	1	2	3	4	5	1	2	3	4	5
1	AT	AT	EP	ET	ET	APST	APST	APST	APST	APST
2	AT	AT	AT	AT	AT	AT	AT	AT	AT	AT
3	GET	GET	GET	GET	GET	ASK	YES	ASK	ASK	ASK
4	N/R	N/R	N/R	N/R	N/R	HAT	HAT	HAT	N/R	N/R
5	HET	ET	HET	HEAD	BET	AT	AT	AT	AT	AT
6	AT	YET	GET	GET	GET	ATS	ATS	ATS	APTS	APTS
7	AT	AT	AT	AT	AT	MATCH	MATCH	HAT	MATCH	MATCH
8	ET	AT	ET	AT	AT	AT	PET	PET	PET	HAT
9	+	AT	AT	+	AT	THAT	AT	AT	AT	AT
10	AT	ET	AT	AT	AT	AT	AT	AT	AT	AT
11	+	+	+	+	+	FAT	+	CATCH	FETCH	CATCH
12	AT	AT	AT	AT	AT	AT	AT	AT	AT	AT
13	AT	AT	YET	AT	AT	FATS	PAPS	FAT	PAPS	PAPS
14	+	+	GET	GET	+	CAPS	CAPS	CAPS	HATS	CAPS
15	AT	AT		AT	AT	ET	AT	ET	AT	AT
16	AT	AT	ET	ET	ET	AT	AT	AT	AT	ATCH
17	DEBT	DEBT	DEBT	AT	AT	HAT	AT	HATCH	AT	AT
18	AT	AT	AT	AT	AT	AT	FAT	HAT	HATCH	HAT
19	GET	GET	GET	GET	GET	MAP	MAPS	MAPS	MAPS	MAPS
20	+	+	+	+	+	MAN	MAN	MAN	CAN	MAN
21	ET	ET	YET	YET	ET	EPS	YEPS	MAPS	MAPS	MAPS
22	GET	GET	GET	GET	GET	ATCH	ATCH	ATCH	ATCH	ATCH
23	AT	AT	AT	AT	AT	AT	AT	AT	AT	AT
24	ET	ET	ET	ET	ET	MATCH	MATCH	MATCH	MATCH	MATCH
25	AT	AT	AT	AT	AT	AT	AT	AT	AT	AT
26	AT	AT	AT	AT	AT	AT	AT	AT	AT	AT
27	GET	GET	GET	GET	GET	APP	APP	MAT	GAP	AT
28	+	GAT	GAT	GAT	GAT	AT	AT	AT	AT	AT
29	AT	AT	AT	AT	AT	AT	AT	AT	AT	AT
30	NET	KEEKEE	MET	MET	MET	PAT	HAT	PAT	HAT	HAT
31	GET	GET	GET	GET	GET	AT	AT	AT	AT	AT
32	AT	AT	ET	ET	IT	AT	MAT	MAT	MAT	MAT
NUMBER CORRECT:	5	3	2	2	3	0	1	0	0	0

# Appendix 6

Subject Responses for the Speech Synthesized Word "Yes" in the High Probability Sentence Condition.

SUBJECT	VOYTRAX PRESENTATION NUMBER					ECHO PRESENTATION NUMBER				
	1	2	3	4	5	1	2	3	4	5
1	+	+	+	+	+	+	+	+	+	+
2	GUESS	+	+	+	+	+	+	+	+	+
3	+	+	+	+	+	+	+	+	+	+
4	N/R	+	+	+	+	+	+	+	+	+
5	+	+	+	+	+	+	+	+	+	+
6	GAS	LESS	WEST	+	LESS	+	+	+	+	WEST
7	N/R	+	+	+	+	N/R	N/R	+	+	+
8	+	+	+	+	+	+	+	+	+	+
9	+	+	+	+	+	+	+	+	+	+
10	N/R	LESS	+	+	+	+	+	+	+	+
11	+	+	+	+	+	+	+	+	+	+
12	+	+	+	+	+	LESS	LESS	+	LESS	LESS
13	GUESS	N/R	+	+	+	+	+	+	+	+
14	+	+	+	+	+	+	+	+	+	+
15	+	+	+	+	+	+	+	+	+	+
16	GAS	+	+	+	+	+	+	+	+	+
17	+	+	+	+	+	+	+	+	LESS	+
18	LESS	+	+	+	+	+	+	+	+	+
19	DRESS	DRESS	DRESS	REST	GUESS	VEST	DRESS	DRESS	DRESS	DRESS
20	GUESS	+	+	+	+	+	+	+	+	+
21	+	+	+	+	+	+	LESS	LESS	LESS	LESS
22	+	+	+	+	+	+	+	+	+	+
23	+	+	+	+	+	+	+	+	+	+
24	GUEST	GUEST	GUESS	GUESS	GUESS	+	NESS	NYES	NYES	LESS
25	+	+	+	+	+	+	+	+	+	+
26	N/R	N/R	N/R	LESS	N/R	N/R	N/R	N/R	N/R	LESS
27	+	+	+	+	+	+	+	+	+	+
28	+	+	+	+	+	+	+	+	+	+
29	+	+	+	+	+	+	+	+	N/R	+
30	HAT	GUEST	HAT	HAT	HAT	LOUDER	US	US	US	LESS
31	DRESS	DRESS	DRESS	DRESS	DRESS	OVER	THERE	YET	YET	YET
32	+	+	+	+	+	N/R	N/R	N/R	N/R	N/R
NUMBER CORRECT:	18	24	26	27	26	25	23	25	22	23



# Appendix G

Subject Responses for the Speech Synthesized Word "Hurt" in the High Probability Sentence Condition.

SUBJECT	VOTRAX PRESENTATION NUMBER					ECHO PRESENTATION NUMBER				
	1	2	3	4	5	1	2	3	4	5
1	+	+	+	+	+	+	+	+	+	+
2	+	+	+	+	+	+	+	+	+	+
3	+	+	+	+	+	+	+	+	+	+
4	+	+	+	+	+	+	+	+	+	+
5	+	+	+	+	+	+	+	+	+	+
6	+	+	+	+	+	+	+	+	+	+
7	EARTH	EARTH	EARTH	+	+	N/R	+	+	+	+
8	+	+	+	+	+	+	+	+	+	+
9	+	+	+	+	+	+	+	+	+	+
10	N/R	+	+	+	+	N/R	N/R	N/R	N/R	+
11	+	+	+	+	+	+	+	+	+	+
12	+	+	+	+	+	+	+	+	N/R	+
13	+	+	+	+	+	+	+	+	+	+
14	+	+	+	+	+	+	+	+	+	+
15	+	+	+	+	+	+	+	+	+	+
16	+	+	+	+	+	+	+	+	+	+
17	+	+	+	+	+	+	+	+	+	+
18	+	+	+	+	+	+	+	+	+	+
19	+	+	+	+	+	+	+	+	+	+
20	+	+	+	+	+	+	+	+	+	+
21	+	+	+	+	+	+	+	+	+	+
22	+	+	+	+	+	+	+	+	+	+
23	+	+	+	+	+	+	+	+	+	+
24	+	+	+	+	+	+	BIRCH	ERCH	BIRCH	BIRCH
25	+	+	+	+	+	+	+	+	+	+
26	+	+	+	+	+	+	+	+	+	+
27	+	+	+	+	+	+	+	+	+	+
28	+	+	+	+	+	+	+	+	+	+
29	+	+	+	+	+	+	+	+	+	+
30	+	+	+	+	+	+	+	+	+	+
31	+	+	+	+	+	+	+	+	+	+
32	+	+	+	+	+	+	+	+	+	+
NUMBER CORRECT:	30	31	31	32	32	30	30	30	29	31

# Appendix G

Subject Responses for the Speech Synthesized word "Watch" in the High Probability Sentence Condition.

SUBJECT	VOTRAX PRESENTATION NUMBER					ECHO PRESENTATION NUMBER				
	1	2	3	4	5	1	2	3	4	5
1	+	+	+	+	+	+	+	+	+	+
2	+	+	+	+	+	+	+	+	+	+
3	+	+	+	+	+	+	+	+	+	+
4	+	+	+	+	+	+	+	+	+	+
5	+	+	+	+	+	+	+	+	+	+
6	+	+	+	+	+	+	+	+	+	+
7	+	+	+	+	+	+	+	+	+	+
8	+	+	+	+	+	+	+	+	+	+
9	+	+	+	+	+	+	+	+	+	+
10	+	+	+	+	+	+	+	+	+	+
11	+	+	+	+	+	+	+	+	+	+
12	+	+	+	+	+	+	+	+	+	+
13	OUT	OUT	N/R	OUT	OUT	+	+	+	+	+
14	+	+	+	+	+	+	+	+	+	+
15	+	+	+	+	+	+	WAW	+	+	+
16	+	+	+	+	+	+	+	+	+	+
17	+	+	+	+	+	+	+	+	+	+
18	+	+	+	+	+	+	+	+	+	+
19	+	+	+	+	+	+	+	+	+	+
20	+	+	+	+	+	+	+	+	+	+
21	+	+	+	+	+	+	+	+	+	+
22	+	+	+	+	+	+	+	+	+	+
23	+	+	+	+	+	+	+	+	+	+
24	+	+	+	+	+	+	+	+	+	+
25	+	+	+	+	+	+	+	+	+	+
26	N/R	N/R	+	+	+	+	+	+	+	+
27	+	+	+	+	+	+	+	+	+	+
28	+	+	+	+	+	+	+	+	+	+
29	+	+	+	+	+	+	+	+	+	+
30	+	+	+	+	+	+	+	+	+	+
31	MUCH	MUCH	+	+	+	+	+	+	+	+
32	+	+	+	+	+	+	+	+	+	+
NUMBER CORRECT:	29	29	31	31	31	32	31	32	32	32

# Appendix B

Subject Responses for the Speech Synthesized Word "Fall" in the High Probability Sentence Condition.

SUBJECT	VOTRAX PRESENTATION NUMBER					ECHO PRESENTATION NUMBER				
	1	2	3	4	5	1	2	3	4	5
1	+	+	+	+	+	+	+	+	+	+
2	+	+	+	+	+	+	+	+	+	+
3	+	+	+	+	+	PHONE	PHONE	+	+	+
4	+	+	+	+	+	HALL	+	+	+	+
5	+	+	+	+	+	+	+	+	+	+
6	+	+	+	+	+	+	+	+	+	+
7	+	+	+	+	+	+	+	+	+	+
8	+	+	+	+	+	+	+	+	+	+
9	+	+	+	+	+	+	+	+	+	+
10	+	+	+	+	+	+	+	+	+	+
11	+	+	+	+	+	+	+	+	+	+
12	+	N/R	+	+	+	N/R	+	+	+	+
13	+	+	+	+	+	+	+	+	+	+
14	BILLS	+	+	+	+	N/R	+	+	+	+
15	+	+	+	+	+	+	+	+	+	+
16	+	+	+	+	+	+	+	+	+	+
17	DOLLAR	+	+	+	+	PHONE	HALL	HALL	HALL	HALL
18	+	+	+	+	+	SUN	+	+	+	+
19	+	+	+	+	+	+	+	+	+	+
20	+	+	+	+	+	+	+	+	+	+
21	+	+	+	+	+	PHONE	PHONE	PHONE	PHONE	PHONE
22	+	+	+	+	+	+	+	+	+	+
23	FGW	+	+	+	+	N/R	+	+	+	+
24	+	+	+	+	+	HALL	+	+	+	+
25	+	+	+	+	+	+	+	+	+	+
26	+	+	+	+	+	N/R	NUMBER	+	+	+
27	+	+	+	+	+	+	+	+	+	+
28	+	+	+	+	+	+	+	+	+	+
29	+	+	+	+	+	+	+	+	+	+
30	+	+	+	+	+	FLOOR	+	+	+	+
31	+	+	+	+	+	+	+	+	+	+
32	N/R	+	+	+	+	PHONE	+	+	+	+
NUMBER										
CORRECT:	28	31	32	32	32	20	28	30	30	30

## Appendix B

Subject Responses for the Speech Synthesized Word "June" in the High Probability Sentence Condition.

SUBJECT	VOTRAX PRESENTATION NUMBER					ECHO PRESENTATION NUMBER				
	1	2	3	4	5	1	2	3	4	5
1	+	+	+	+	+	+	+	+	+	+
2	+	+	+	+	+	+	+	+	+	+
3	+	+	+	+	+	+	+	+	+	+
4	+	+	+	+	+	+	+	+	+	+
5	+	+	+	+	+	+	+	+	+	+
6	+	+	+	+	+	+	+	+	+	+
7	+	+	+	+	+	+	+	+	+	+
8	+	+	+	+	+	+	+	+	+	+
9	+	+	+	+	+	+	+	+	+	+
10	+	+	+	+	+	+	+	+	+	+
11	+	+	+	+	+	+	+	+	+	+
12	+	+	+	+	N/R	+	+	+	+	+
13	+	+	+	+	+	+	+	+	+	+
14	+	+	+	+	+	+	+	+	+	+
15	+	+	+	+	+	+	+	+	+	+
16	+	+	+	+	+	+	+	+	+	+
17	+	+	+	+	+	+	+	+	+	+
18	+	+	+	+	+	+	+	+	+	+
19	+	+	+	+	+	+	+	+	+	+
20	+	+	+	+	+	+	+	+	+	+
21	+	+	+	+	+	+	+	+	+	+
22	+	+	+	+	+	+	+	+	+	+
23	+	+	+	+	+	+	+	+	+	+
24	+	+	+	+	+	+	+	+	+	+
25	+	+	+	+	+	+	+	+	+	+
26	+	+	+	+	+	+	+	+	+	+
27	+	+	+	+	+	+	+	+	+	+
28	+	+	+	+	+	+	+	+	+	+
29	+	+	+	+	+	+	+	+	+	+
30	+	+	+	+	+	+	+	+	+	+
31	+	+	+	+	+	+	+	+	+	+
32	+	+	+	+	+	+	+	+	+	+
NUMBER CORRECT:	32	32	32	32	31	32	32	32	32	32

# Appendix 6

Subject Responses for the Speech Synthesized Word "Thing" in the High Probability Sentence Condition.

SUBJECT	VOTRAX PRESENTATION NUMBER					ECHO PRESENTATION NUMBER				
	1	2	3	4	5	1	2	3	4	5
1	+	+	+	+	+	+	+	+	+	+
2	+	+	+	+	+	+	+	+	+	+
3	+	+	+	+	+	+	+	+	+	+
4	+	+	+	+	+	+	+	+	+	+
5	+	+	+	+	+	+	+	+	+	+
6	+	+	+	+	+	N/R	+	+	+	+
7	+	+	+	+	+	+	+	+	+	+
8	+	+	+	+	+	+	+	+	+	+
9	+	+	+	+	+	+	+	+	+	+
10	+	+	+	+	+	N/R	+	+	+	+
11	+	+	+	+	+	+	+	+	+	+
12	+	+	+	+	+	N/R	+	+	+	+
13	+	+	+	+	+	N/R	+	+	+	+
14	+	+	+	+	+	N/R	N/R	+	+	+
15	+	+	+	+	+	+	+	+	+	+
16	+	+	+	+	+	THIN	THIN	+	+	+
17	+	+	+	+	+	+	+	+	+	+
18	+	+	+	+	+	+	+	+	+	+
19	+	+	+	+	+	+	+	+	+	+
20	+	+	+	+	+	THIN	+	+	+	+
21	+	+	+	+	+	+	+	+	+	+
22	+	+	+	+	+	+	+	+	+	+
23	+	+	+	+	+	+	+	THIN	THIN	THIN
24	+	+	+	+	+	+	+	+	+	+
25	+	+	+	+	+	+	+	+	+	+
26	+	+	+	+	+	+	+	+	+	+
27	+	+	+	+	+	+	+	+	+	+
28	+	+	+	+	+	+	+	+	+	+
29	+	+	+	+	+	+	+	+	+	+
30	+	+	+	+	+	CHEF	+	+	+	+
31	+	+	+	+	+	+	+	+	+	+
32	+	+	+	+	+	+	+	+	+	+
NUMBER CORRECT:	32	32	32	32	32	24	30	31	31	31

# Appendix B

Subject Responses for the Speech Synthesized Word "Bath" in the High Probability Sentence Condition.

SUBJECT	VOTRAX PRESENTATION NUMBER					ECHO PRESENTATION NUMBER				
	1	2	3	4	5	1	2	3	4	5
1	BISS	BAT	+	+	+	MASS	+	+	+	+
2	+	BASS	+	+	+	N/R	+	+	+	+
3	+	+	+	+	+	N/R	+	+	+	+
4	N/R	N/R	N/R	N/R	+	N/R	N/R	+	+	N/R
5	+	+	+	+	+	+	+	+	+	+
6	+	+	+	+	+	N/R	+	+	+	+
7	+	+	+	+	+	N/R	MASK	MASK	MASK	+
8	N/R	N/R	+	+	+	N/R	+	+	+	+
9	+	+	+	+	+	N/R	+	+	+	+
10	+	N/R	+	+	+	N/R	+	+	+	+
11	N/R	CAT	CAT	BAT	+	N/R	+	+	+	+
12	+	+	+	+	+	MATH	+	+	N/R	+
13	+	+	+	+	+	MASK	MASK	MASK	MASK	MASK
14	+	+	+	+	+	N/R	+	+	+	+
15	+	BET	+	+	+	MESS	MESS	+	+	+
16	+	+	+	+	+	N/R	+	+	+	+
17	+	+	+	+	+	MATH	+	+	+	+
18	+	+	+	+	+	MESS	+	+	+	+
19	+	+	+	+	+	REST	+	+	+	+
20	+	+	+	+	+	WOMAN	+	+	+	+
21	+	+	+	+	+	MESS	+	+	+	+
22	+	+	+	+	+	N/R	+	+	+	+
23	+	+	+	+	+	N/R	+	+	+	+
24	+	+	+	+	+	*UNT	MATCH	+	+	BA
25	N/R	BET	+	+	+	MASK	MASK	MASK	MASK	+
26	+	BAT	BAT	BAT	+	N/R	+	+	+	+
27	+	+	+	+	+	N/R	+	+	+	+
28	+	+	+	+	+	N/R	+	+	+	+
29	N/R	BET	+	+	+	MESS	N/R	MESS	N/R	+
30	+	+	+	+	+	MASK	+	+	+	+
31	+	+	+	+	+	N/R	+	+	+	+
32	+	+	+	+	+	N/R	+	+	+	+

NUMBER

CORRECT: 26 22 29 29 32 1 25 26 27 29

\*UNT = Unintelligible Utterance

# Appendix B

Subject Responses for the Speech Synthesized Word "Knife" in the High Probability Sentence Condition.

SUBJECT	VOTRAX PRESENTATION NUMBER					ECHO PRESENTATION NUMBER				
	1	2	3	4	5	1	2	3	4	5
1	WIFE	+	+	WIFE	+	+	+	+	+	+
2	LIFE	+	+	+	+	N/R	LIFE	+	+	+
3	LIGHT	+	+	+	+	+	+	+	+	+
4	N/R	+	+	+	+	N/R	N/R	N/R	+	+
5	LIGHT	+	+	+	+	+	+	+	+	+
6	+	+	+	+	+	+	+	+	+	+
7	+	+	+	+	+	+	+	+	+	+
8	+	+	+	+	+	N/R	+	+	+	+
9	N/R	+	+	+	+	N/R	+	+	+	+
10	N/R	+	+	+	+	N/R	N/R	N/R	N/R	+
11	+	+	+	+	+	+	+	+	+	+
12	LIFE	+	LIFE	+	LIFE	+	+	+	+	+
13	+	+	+	+	+	+	+	+	+	+
14	+	+	+	+	+	N/R	+	+	+	+
15	+	+	+	+	+	N/R	+	+	+	+
16	LIKE	WIKE	LIFE	WIKE	WIKE	N/R	+	+	+	+
17	+	+	+	+	+	MATE	+	+	+	+
18	N/R	+	+	+	+	N/R	+	+	+	+
19	+	+	+	+	+	+	+	+	+	+
20	WIFE	+	+	+	+	WIFE	+	+	+	+
21	+	+	+	+	+	N/R	+	+	+	+
22	LIFE	+	+	+	+	WE	+	+	+	+
23	LIFE	LIFE	LIFE	LIFE	LIFE	+	+	+	LIFE	LIFE
24	MICE	+	+	WIFE	+	*UNT	MY	WHY	MY	+
25	+	+	+	+	+	WIFE	+	+	+	+
26	+	+	+	+	+	+	+	+	+	+
27	+	+	+	+	+	LICE	MIFF	+	+	+
28	+	+	+	+	+	+	+	+	+	+
29	+	+	+	+	+	N/R	+	+	+	+
30	+	+	+	+	+	MICE	+	+	+	+
31	+	+	+	+	+	MICE	MICE	+	MICE	+
32	+	WIFE	+	WIFE	WIFE	N/R	+	+	+	+

NUMBER										
CORRECT:	18	29	29	27	28	12	26	29	28	31

\*UNT = Unintelligible Utterance

# Appendix G

Subject Responses for the Speech Synthesized Word "Dab" in the High Probability Sentence Condition.

SUBJECT	VOTRAX PRESENTATION NUMBER					ECHO PRESENTATION NUMBER				
	1	2	3	4	5	1	2	3	4	5
1	+	+	+	+	+	+	+	+	+	+
2	N/R	+	+	+	+	+	+	+	+	+
3	"L"	+	+	+	+	+	+	+	+	+
4	+	+	+	+	+	+	+	+	+	+
5	+	+	+	+	+	+	+	+	+	+
6	+	+	+	+	+	+	+	+	+	+
7	+	+	+	+	+	+	+	+	+	+
8	N/R	+	+	+	+	+	+	+	+	+
9	N/R	+	+	+	+	+	+	+	+	+
10	+	+	+	+	+	+	+	+	+	+
11	+	+	+	+	+	+	+	+	+	+
12	+	+	+	+	+	+	+	+	N/R	+
13	N/R	N/R	+	+	+	N/R	N/R	AT	+	+
14	+	+	+	+	+	+	+	+	+	+
15	+	+	+	+	+	+	+	+	+	+
16	+	+	+	+	+	KA	+	+	+	+
17	+	+	+	+	+	+	+	+	+	+
18	+	+	+	+	+	+	+	+	+	+
19	+	+	+	+	+	+	+	+	+	+
20	+	+	+	+	+	+	+	+	+	+
21	N/R	+	+	+	+	+	+	+	+	+
22	REB	ABB	ABB	+	+	N/R	N/R	A	+	+
23	N/R	N/R	N/R	+	+	N/R	N/R	N/R	+	+
24	A	+	+	+	TAB	+	+	+	CAT	CAT
25	"B"	N/R	+	+	+	"F"	"F"	+	+	+
26	+	+	+	+	+	+	+	+	+	+
27	+	+	+	+	+	+	+	+	+	+
28	+	+	+	+	+	+	+	+	+	+
29	+	+	+	+	+	+	+	+	+	+
30	+	+	+	+	+	+	+	+	+	+
31	+	+	+	+	+	+	+	+	+	+
32	+	+	+	+	+	+	+	+	+	+
NUMBER CORRECT:	22	28	30	32	31	27	28	29	30	31



# Appendix 6

Subject Responses for the Speech Synthesized Word "Less" in the High Probability Sentence Condition.

SUBJECT	VOTRAX PRESENTATION NUMBER					ECHO PRESENTATION NUMBER				
	1	2	3	4	5	1	2	3	4	5
1	+	+	+	+	+	+	+	+	+	+
2	+	+	+	+	+	+	+	+	+	+
3	+	+	+	+	+	+	+	+	+	+
4	+	+	+	+	+	+	+	+	+	+
5	+	+	+	+	+	+	+	+	+	+
6	+	+	+	+	+	+	+	+	+	+
7	+	+	+	+	+	MASK	MASK	+	+	+
8	+	+	+	+	+	+	+	+	+	+
9	+	+	+	+	+	N/R	+	+	+	+
10	+	+	+	+	+	+	+	+	+	+
11	+	+	+	+	+	THAT	+	+	+	+
12	+	+	+	+	+	+	+	+	N/R	+
13	+	+	+	+	+	+	+	+	+	+
14	+	+	+	+	+	N/R	+	+	+	+
15	+	+	+	+	+	+	+	+	+	+
16	+	+	+	+	+	NESS	+	+	+	+
17	+	+	+	+	+	+	+	+	+	+
18	+	+	+	+	+	+	+	+	+	+
19	+	+	+	+	+	+	+	+	+	+
20	+	+	+	+	+	PIZZA	+	+	+	+
21	+	+	+	+	+	+	+	+	+	+
22	+	+	+	+	+	+	+	+	+	+
23	+	+	+	+	+	+	+	+	+	+
24	+	+	+	+	+	+	+	+	+	+
25	+	+	+	+	+	MESS	MESS	+	+	+
26	+	+	+	+	+	+	+	+	+	+
27	+	+	+	+	+	+	+	+	+	+
28	+	+	+	+	+	+	+	+	+	+
29	+	+	+	+	+	N/R	+	+	+	+
30	+	+	+	+	+	MAST	+	+	+	+
31	+	+	+	+	+	N/R	+	+	+	+
32	+	+	+	+	+	N/R	+	+	+	+
NUMBER										
CORRECT:	32	32	32	32	32	21	30	32	31	32

# Appendix B

Subject Responses for the Speech Synthesized Word "Yet" in the High Probability Sentence Condition.

SUBJECT	VOTRAX PRESENTATION NUMBER					ECHO PRESENTATION NUMBER				
	1	2	3	4	5	1	2	3	4	5
1	+	+	+	+	+	YEP	+	+	+	+
2	+	+	+	+	+	+	+	+	+	+
3	+	+	+	+	+	YES	+	+	+	+
4	+	+	+	+	+	+	+	+	+	+
5	+	+	+	+	+	+	+	+	+	+
6	+	+	+	+	+	N/R	+	+	+	+
7	+	+	+	+	+	+	+	+	+	+
8	+	+	+	+	+	+	+	+	+	+
9	+	+	+	+	+	+	+	+	+	+
10	+	+	+	+	+	+	+	+	+	+
11	+	+	+	+	+	WIFE	+	+	+	+
12	+	+	+	+	N/R	N/R	+	+	+	+
13	+	+	+	+	+	+	+	+	N/R	+
14	+	+	+	+	+	+	+	+	+	+
15	+	+	+	+	+	N/R	+	+	N/R	N/R
16	+	+	+	+	+	YACHT	+	+	+	+
17	+	+	+	+	+	BAT	+	+	+	+
18	+	+	+	+	+	+	+	+	+	+
19	+	+	+	+	+	+	+	+	+	+
20	+	+	+	+	+	CAN	CAN	WIFE	CAT	BAT
21	+	+	+	+	+	+	+	+	+	+
22	+	+	+	+	+	+	+	+	+	+
23	+	+	+	+	+	N/R	+	+	+	+
24	+	+	+	+	+	MATCH	MATCH	MATCH	N/R	MATCH
25	+	+	+	+	+	N/R	+	+	+	+
26	+	+	+	+	+	+	+	+	+	+
27	+	+	+	+	+	NYET	+	+	+	+
28	+	+	+	+	+	+	+	+	+	+
29	+	+	+	+	+	N/R	+	+	+	+
30	+	+	+	+	+	DAD	+	+	+	+
31	+	+	+	+	+	N/R	+	+	+	+
32	+	+	+	+	+	+	ATTACK	ATTACK	ATTACK	+
NUMBER										
CORRECT:	32	32	32	32	31	16	29	29	27	29

# Appendix B

Subject Responses for the Speech Synthesized Word "Shirt" in the High Probability Sentence Condition.

SUBJECT	VOTRAX PRESENTATION NUMBER					EDHO PRESENTATION NUMBER				
	1	2	3	4	5	1	2	3	4	5
1	+	+	+	+	+	+	+	+	+	+
2	+	+	+	+	+	+	+	+	+	+
3	+	+	+	+	+	+	+	+	+	+
4	+	+	+	+	+	+	+	+	+	+
5	+	+	+	+	+	+	+	+	+	+
6	+	+	+	+	+	+	+	+	+	+
7	+	+	+	+	+	+	+	+	+	+
8	+	+	+	+	+	+	+	+	+	+
9	+	+	+	+	+	+	+	+	+	+
10	+	+	+	+	+	+	+	+	+	+
11	+	+	+	+	+	+	+	+	+	+
12	+	+	+	+	+	+	+	+	N/R	+
13	+	+	+	+	+	+	+	+	+	+
14	+	+	+	+	+	+	+	+	+	+
15	+	+	+	+	+	+	+	+	+	+
16	+	+	+	+	+	+	+	+	+	+
17	+	+	+	+	+	+	+	+	+	+
18	+	+	+	+	+	+	+	+	+	+
19	+	+	+	+	+	+	+	+	+	+
20	+	+	+	+	+	+	+	+	+	+
21	+	+	+	+	+	SHIRTS	SHIRTS	+	+	+
22	+	+	+	+	+	+	+	+	+	+
23	+	+	+	+	+	+	+	+	+	+
24	+	+	+	+	+	+	+	+	CHURCH	+
25	+	+	+	+	+	+	+	+	+	+
26	+	+	+	+	+	+	+	+	+	+
27	+	+	+	+	+	+	+	+	+	+
28	+	+	+	+	+	+	+	+	+	+
29	+	+	+	+	+	+	+	+	+	+
30	+	+	+	+	+	+	+	+	+	+
31	+	+	+	+	+	+	EAT	+	+	+
32	+	+	+	+	+	+	+	+	+	+
NUMBER										
CORRECT:	32	32	32	32	32	31	30	32	30	32

# Appendix G

Subject Responses for the Speech Synthesized Word "Heard" in the High Probability Sentence Condition.

SUBJECT	VOTRAX PRESENTATION NUMBER					ECHO PRESENTATION NUMBER				
	1	2	3	4	5	1	2	3	4	5
1	+	+	+	+	+	PERFECT	+	+	+	+
2	+	+	+	+	+	N/R	+	+	+	+
3	+	+	+	+	+	N/R	SANDPIPER	+	+	+
4	+	+	+	+	+	N/R	+	+	+	+
5	+	+	+	+	+	NEWSPAPER	+	+	+	+
6	+	+	+	+	+	+	+	+	+	+
7	+	+	+	+	+	THEORY	THEORY	+	+	+
8	+	+	+	+	+	SANDPIPER	+	+	+	+
9	+	+	+	+	+	N/R	+	+	+	+
10	+	+	+	+	+	PAPER	PAPER	PAPER	PAPER	+
11	+	+	+	+	+	UMPIRE	UMPIRE	UMPIRE	UMPIRE	UMPIRE
12	+	+	+	N/R	+	N/R	N/R	+	+	+
13	+	+	+	+	+	SANDPIPER	SANDPIPER	+	+	+
14	+	+	+	+	+	N/R	SANDPIPER	SANDPIPER	PIPER	PIPER
15	+	+	+	+	+	+	+	+	+	+
16	+	+	+	+	+	SANDPIPER	SANDPIPER	+	+	+
17	+	+	+	+	+	MATH	HAMBERG	+	+	+
18	+	+	+	+	+	+	+	+	+	+
19	+	+	+	+	+	LIGHTER	OUTSIDER	+	+	+
20	+	+	+	+	+	BIRD	+	+	+	+
21	+	+	+	+	+	DIVER	DIVER	+	+	+
22	+	+	+	+	+	WIPER	+	+	+	+
23	+	+	+	+	+	PIPER	+	+	+	+
24	+	+	+	+	+	N/R	+	+	+	+
25	+	+	+	+	+	PAPER	+	+	+	+
26	+	+	+	+	+	BIRD	N/R	N/R	PAPER	PAPER
27	+	+	+	+	+	+	+	+	+	+
28	+	+	+	+	+	+	+	+	+	+
29	+	+	+	+	+	DIVER	+	+	+	+
30	+	+	+	+	+	SUPPER	SANDPIPER	+	+	+
31	+	+	+	+	+	PLAYER	+	+	+	+
32	+	+	+	+	+	PERFECT	PERFECT	+	PERFECT	+
NUMBER										
CORRECT:	32	32	32	31	32	5	18	28	27	29

# Appendix B

Subject Responses for the Speech Synthesized Word "Notch" in the High Probability Sentence Condition.

SUBJECT	VOTRAX					ECHO				
	PRESENTATION NUMBER					PRESENTATION NUMBER				
	1	2	3	4	5	1	2	3	4	5
1	WATCH	+	+	+	+	+	+	+	+	+
2	LOTCH	LOTCH	+	+	+	+	+	+	+	+
3	+	+	+	+	+	+	+	+	+	+
4	N/R	N/R	N/R	+	+	N/R	N/R	N/R	+	+
5	WATCH	WATCH	WATCHED	WATCH	WATCH	N/R	NOT	NOT	NOT	NOT
6	N/R	N/R	+	+	+	+	+	+	+	+
7	LODGE	LODGE	LODGE	LODGE	+	+	+	+	+	+
8	+	+	+	+	+	+	+	+	+	+
9	MOTCH	+	+	+	+	+	+	+	+	+
10	N/R	N/R	+	+	+	+	+	+	+	+
11	LODGE	LODGE	+	+	+	+	+	+	+	+
12	N/R	LUNCH	N/R	N/R	+	+	+	+	+	+
13	NOT	NOT	+	NOT	+	+	+	+	+	+
14	N/R	+	+	+	+	+	+	+	+	+
15	N/R	LOT	N/R	NOT	NOT	N/R	N/R	N/R	N/R	MILE
16	LOTCH	LOTCH	LOTCH	LODGE	LOTCH	MOTCH	MOTCH	USH	MATCH	MUSS
17	+	+	+	+	+	+	+	+	+	+
18	+	+	+	+	+	+	+	+	+	+
19	LUNCH	WATCH	WATCH	WATCH	LUNCH	LUNCH	LUNCH	WATCH	WATCH	LUNCH
20	WATCH	WATCH	+	+	+	+	+	+	+	+
21	LOT	WATCH	LOT	LOT	MONTH	N/R	MUCH	N/R	MUNT	N/R
22	+	+	+	+	+	+	+	+	+	+
23	N/R	+	+	+	+	+	+	+	+	+
24	MARCH	+	+	+	+	MOTCH	MOTCH	+	+	+
25	TIME	N/R	GONE	NOT	NOT	NOT	NOT	NOT	NOT	N/R
26	N/R	N/R	NOT	N/R	N/R	N/R	N/R	N/R	N/R	N/R
27	LOTCH	LOTCH	LOTCH	+	+	+	+	+	+	LOTCH
28	+	+	+	+	+	+	+	+	+	+
29	N/R	N/R	N/R	N/R	N/R	MARCH	MARCH	MARCH	MARCH	MARCH
30	+	+	+	+	+	+	+	+	+	+
31	LOT	+	+	+	+	MONTH	MARK	MARK	MARK	MONTH
32	N/R	WATCH	WATCH	WATCH	+	N/R	NOT	N/R	NOT	NOT
NUMBER CORRECT:	7	13	19	20	24	20	20	21	22	21

# Appendix B

Subject Responses for the Speech Synthesized Word "Walk" in the High Probability Sentence Condition.

SUBJECT	VOTRAX PRESENTATION NUMBER					ECHO PRESENTATION NUMBER				
	1	2	3	4	5	1	2	3	4	5
1	+	+	+	+	+	+	+	+	+	+
2	+	+	+	+	+	+	+	+	+	+
3	+	+	+	+	+	+	+	+	+	+
4	+	+	+	+	+	+	+	+	+	+
5	+	+	+	+	+	+	+	+	+	+
6	+	+	+	+	+	+	+	+	+	+
7	+	+	+	+	+	+	+	+	+	+
8	+	+	+	+	+	+	+	+	+	+
9	+	+	+	+	+	+	+	+	+	+
10	+	+	+	+	+	+	+	+	+	+
11	+	+	+	+	+	+	+	+	+	+
12	+	+	+	+	+	+	+	+	+	+
13	+	+	+	+	+	+	+	+	+	+
14	+	+	+	+	+	+	+	+	+	+
15	+	+	+	+	+	+	+	+	+	+
16	+	+	+	+	+	+	+	+	+	+
17	+	+	+	+	+	+	+	+	+	+
18	+	+	+	+	+	+	+	+	+	+
19	+	+	+	+	+	+	+	+	+	+
20	+	+	+	+	+	+	+	+	+	+
21	+	+	+	+	+	+	+	+	+	+
22	+	+	+	+	+	+	+	+	+	+
23	+	+	+	+	+	+	+	+	+	+
24	+	+	+	+	LODGE	+	+	+	+	+
25	+	+	+	+	+	+	+	+	+	+
26	+	+	+	+	+	+	+	+	+	+
27	+	+	+	+	+	+	+	+	+	+
28	+	+	+	+	+	+	+	+	+	+
29	+	+	+	+	+	+	+	+	+	+
30	+	+	+	+	+	+	+	+	+	+
31	+	+	+	+	+	+	+	+	+	+
32	+	+	+	+	+	+	+	+	+	+
NUMBER										
CORRECT:	32	32	32	32	31	32	32	32	32	32

# Appendix B

Subject Responses for the Speech Synthesized Word "Wall" in the High Probability Sentence Condition.

SUBJECT	VOTRAX PRESENTATION NUMBER					ECHO PRESENTATION NUMBER				
	1	2	3	4	5	1	2	3	4	5
1	+	+	+	+	+	N/R	WARM	WOM	FOAM	WOM
2	+	+	+	+	+	+	+	+	+	+
3	+	+	+	+	+	ROOM	ROOM	+	ROOM	+
4	+	+	+	+	+	+	+	+	+	+
5	+	+	+	+	+	+	+	+	+	+
6	+	+	+	+	+	+	+	+	+	+
7	+	+	+	+	+	LAWN	LAWN	LAWN	LAWN	LAWN
8	+	+	+	+	+	+	+	+	+	+
9	+	+	+	+	+	+	+	+	+	+
10	+	+	+	+	+	+	+	+	+	+
11	+	+	+	+	+	N/R	LAWN	LAWN	LAWN	LAWN
12	+	+	+	+	N/R	+	N/R	N/R	+	+
13	+	+	+	+	+	+	+	+	+	+
14	+	+	+	+	+	+	+	+	+	+
15	+	+	+	+	+	+	+	+	+	+
16	+	+	+	+	+	+	+	+	+	+
17	+	+	+	+	+	+	+	+	+	+
18	+	+	+	+	+	N/R	ONE	ONE	ONE	ONE
19	+	+	+	+	+	+	+	+	+	+
20	+	+	+	+	+	+	+	+	+	+
21	+	+	+	+	+	+	+	+	+	+
22	+	+	+	+	+	+	+	+	+	+
23	+	+	+	+	+	+	+	+	+	+
24	+	+	+	+	+	+	+	+	+	+
25	+	+	+	+	+	N/R	N/R	ONE	+	+
26	+	+	+	+	+	RUN	N/R	RUN	RUN	RUN
27	+	+	+	+	+	+	+	+	+	+
28	+	+	+	+	+	LAWN	LAWN	LAWN	LAWN	LAWN
29	+	+	+	+	+	N/R	N/R	N/R	N/R	N/R
30	+	+	+	+	+	+	+	WARM	+	STOVE
31	+	+	+	+	+	ROOM	ROOM	ROOM	ROOM	ROOM
32	+	+	+	+	+	LAWN	+	+	+	+
NUMBER										
CORRECT:	32	32	32	32	31	21	21	21	23	23

# Appendix 6

Subject Responses for the Speech Synthesized Word "Fog" on the High Probability Sentence Condition.

SUBJECT	VOTRAX PRESENTATION NUMBER					EC+D PRESENTATION NUMBER				
	1	2	3	4	5	1	2	3	4	5
1	+	+	+	+	+	+	+	+	+	+
2	+	+	+	+	+	+	+	+	+	+
3	+	+	+	+	+	+	+	+	+	+
4	+	+	+	+	+	+	+	+	+	+
5	+	+	+	+	+	HOBBY	HOBBY	HOBBY	+	+
6	N/R	+	+	+	+	N/R	+	+	+	+
7	+	+	+	+	+	+	+	+	+	+
8	+	+	+	+	+	+	+	+	+	+
9	N/R	+	+	+	+	+	+	+	+	+
10	N/R	N/R	N/R	N/R	N/R	BOWIE	N/R	N/R	HARVEY	HARVEY
11	N/R	+	+	+	+	N/R	+	+	+	+
12	N/R	N/R	N/R	N/R	N/R	N/R	N/R	N/R	N/R	N/R
13	+	+	+	+	+	HOBBY	N/R	N/R	+	+
14	+	+	+	+	+	+	+	+	+	+
15	+	+	+	+	+	+	+	+	+	+
16	FOWL	+	+	+	+	LOBBY	NIGHT	+	+	+
17	+	+	+	+	+	HONEY	COFFEE	+	+	+
18	+	+	+	+	+	+	N/R	+	+	+
19	+	+	+	+	+	+	+	+	+	+
20	+	+	+	+	+	+	+	+	+	+
21	+	+	+	+	+	+	+	+	+	+
22	FIRE	FIE	FIE	FIE	FIE	FIE	FIE	LIE	FIE	FIRE
23	+	+	+	+	+	+	+	+	+	+
24	+	+	+	+	+	+	+	+	+	+
25	N/R	+	+	+	+	N/R	N/R	+	+	+
26	+	+	+	+	+	N/R	+	+	+	+
27	+	+	+	+	+	+	HAVEN	+	+	+
28	+	+	+	+	+	+	+	+	+	+
29	+	+	+	+	+	+	+	+	+	+
30	+	+	+	+	+	+	+	+	+	+
31	+	+	+	+	+	+	+	+	+	+
32	+	+	+	+	+	+	+	+	+	+
NUMBER CORRECT:	24	29	29	29	29	21	22	28	29	29



# Appendix G

Subject Responses for the Speech Synthesized Word "Moon" in the High Probability Sentence Condition.

SUBJECT	VOTRAX PRESENTATION NUMBER					ECHO PRESENTATION NUMBER				
	1	2	3	4	5	1	2	3	4	5
1	+	+	+	+	+	BOOM	*UNT	LOOM	+	+
2	+	+	+	+	+	N/R	LOOM	LOON	+	+
3	+	+	+	+	+	NOON	NOON	+	+	+
4	+	+	+	+	+	N/R	N/R	N/R	+	+
5	+	+	+	+	+	+	+	+	+	+
6	+	+	+	+	+	N/R	N/R	N/R	N/R	N/R
7	+	+	+	+	+	+	+	+	+	+
8	+	+	+	+	+	N/R	+	+	+	+
9	+	+	+	+	+	N/R	LOON	LOON	LOON	LOON
10	+	+	+	+	+	N/R	N/R	+	+	+
11	+	+	+	+	+	JUNE	JUNE	JUNE	+	N/R
12	+	+	+	+	+	+	N/R	+	+	N/R
13	+	+	+	+	+	N/R	N/R	N/R	N/R	N/R
14	+	+	+	+	+	N/R	+	+	+	+
15	+	+	+	+	+	SALOON	+	+	+	+
16	+	+	+	+	+	NOON	LOON	+	+	+
17	+	+	+	+	+	+	+	+	+	LOONS
18	+	+	+	+	+	+	+	+	+	+
19	+	+	+	+	+	TWO	TWO	+	+	+
20	+	+	+	+	+	LOON	LOON	+	+	+
21	+	+	+	+	+	NOON	NOON	NOON	NOON	NOON
22	+	+	+	+	+	+	+	+	+	+
23	+	+	+	+	+	+	+	LOON	LOON	LOON
24	+	+	+	+	+	+	LOON	LOON	LOON	LOON
25	+	+	+	+	+	N/R	AFTERNOON	N/R	+	LOON
26	+	+	+	+	+	N/R	N/R	N/R	+	LOON
27	+	+	+	+	+	+	+	+	+	+
28	+	+	+	+	+	N/R	N/R	+	+	+
29	+	+	+	+	+	N/R	N/R	+	+	+
30	+	+	+	+	+	LAGOON	BALLOON	NOON	+	+
31	+	+	+	+	+	ROOM	ROOM	ROOM	ROOM	ROOM
32	+	+	+	+	+	N/R	N/R	+	+	+
NUMBER										
CORRECT:	32	32	32	32	32	9	10	18	25	20

\*UNT = Unintelligible Utterance

# Appendix B

Subject Responses for the Speech Synthesized Word "Jews" in the High Probability Sentence Condition.

SUBJECT	VOTRAX PRESENTATION NUMBER					ECHO PRESENTATION NUMBER				
	1	2	3	4	5	1	2	3	4	5
1	JEWELS	JEWELS	JEWELS	JEWELS	JEWEL	JEWELS	JUICE	JEWEL	JEWELS	JEWELS
2	N/R	N/R	JEWELS	+	N/R	+	+	+	+	+
3	LOSE	CHOOSE	N/R	CHOOSE	N/R	JUICE	JUICE	SHOES	SHOES	NEWS
4	N/R	N/R	N/R	N/R	N/R	N/R	N/R	N/R	N/R	N/R
5	SHOES	JUICE	SHOE	JUICE	SHOES	CHOOSE	CHOOSE	CHOOSE	CHOOSE	CHOOSE
6	+	+	+	+	+	N/R	N/R	N/R	+	+
7	NOON	NOON	NOON	NOON	NOON	JULIUS	JULIUS	JULIUS	JULIUS	JULIUS
8	+	+	+	+	+	N/R	N/R	N/R	+	+
9	+	+	+	+	+	+	+	+	+	+
10	N/R	N/R	N/R	N/R	TOOLS	N/R	N/R	N/R	N/R	N/R
11	JEWELS	JEWELS	JEWELS	JEWELS	JEWELS	JEWELS	JEWELS	JEWELS	JEWELS	JEWELS
12	N/R	N/R	N/R	N/R	N/R	N/R	N/R	N/R	N/R	JULIUS
13	+	JUICE	JUICE	JUICE	JUICE	JUICE	JUICE	JUICE	JUICE	JUICE
14	N/R	JEWELS	JEWELS	JEWELS	JEWELS	JULIE'S	JULIE'S	JULIE'S	N/R	N/R
15	CHOOSE	CHOOSE	+	+	N/R	N/R	N/R	N/R	CHOOSE	N/R
16	+	+	+	+	+	JEWELS	JEWELS	JEWELS	JEWELS	+
17	JEWELS	JEWELS	JEWELS	JEWELS	JEWELS	JEWELS	JEWELS	JEWELS	JEWELS	JEWELS
18	+	+	+	+	+	N/R	+	+	+	+
19	JUICE	JUICE	JUICE	JUICE	JUICE	JUICE	JUICE	JUICE	JUICE	JUICE
20	JEWELS	JEWELS	JEWELS	JEWELS	JEWELS	JEWELS	JEWELS	JEWELS	JEWELS	JEWELS
21	N/R	CHOOSE	CHOOSE	CHOOSE	CHOOSE	N/R	JUDAS	JUDAS	JUDAS	JEWIS
22	+	+	+	+	+	+	+	USED	+	USE
23	+	+	+	+	+	N/R	+	N/R	N/R	N/R
24	+	YOU	+	N/R	JUDE	+	+	+	N/R	+
25	JEWELS	JEWELS	JEWELS	JEWELS	JEWELS	N/R	JULIUS	JULIUS	JULIUS	JULIUS
26	N/R	N/R	N/R	N/R	N/R	N/R	N/R	N/R	N/R	N/R
27	JUICE	JUPES	JUKE	JUVE	JUPES	JUICE	JUICE	JUICE	JUICE	JUICE
28	N/R	N/R	N/R	N/R	N/R	JEWELS	JEWELS	N/R	N/R	N/R
29	+	+	+	+	+	N/R	N/R	+	+	+
30	+	+	+	+	+	JUICE	JUICE	JUICE	+	+
31	JUICE	JUICE	SHOES	JUICE	JUICE	JUICE	JUICE	JUICE	JUICE	JUICE
32	JUNE	N/R	JUNE	N/R	JUNE	JULIE'S	JULIE'S	N/R	JULIE'S	JULIE'S

NUMBER

CORRECT: 11 9 11 11 9 4 6 5 8 9

# Appendix B

Subject Responses for the Speech Synthesized word "Sing" in the High Probability Sentence Condition.

SUBJECT	VOTRAX PRESENTATION NUMBER					ECHO PRESENTATION NUMBER				
	1	2	3	4	5	1	2	3	4	5
1	+	+	+	+	+	+	+	+	+	SIN
2	+	+	+	+	+	+	+	+	+	+
3	+	+	+	+	+	N/R	N/R	N/R	+	N/R
4	N/R	+	+	+	+	+	+	+	+	+
5	HIS	WILSON	WILSON	WILSON	SEE	N/R	HIM	WILSON	WILSON	WILSON
6	+	+	+	+	+	+	+	+	+	+
7	IN	+	+	+	+	WOMEN	WOMEN	N/R	WOMEN	WOMEN
8	IN	+	+	+	+	+	+	+	+	+
9	+	+	+	+	+	IN	IN	WOMEN	WOMEN	IN
10	+	+	+	+	+	+	+	+	+	+
11	N/R	N/R	N/R	+	+	+	+	+	+	+
12	N/R	N/R	N/R	N/R	+	N/R	N/R	N/R	N/R	N/R
13	+	+	+	+	+	+	+	+	+	+
14	N/R	N/R	IN	N/R	N/R	N/R	WILSON	WILSON	WILSON	WILSON
15	+	+	+	+	+	LESSON	N/R	+	+	+
16	+	+	+	+	+	HIM	HIM	HIM	HIM	HIM
17	+	+	+	+	+	WOMEN	WOMEN	WOMEN	WOMEN	WOMEN
18	+	+	+	+	+	+	+	+	+	+
19	+	+	+	+	+	+	+	+	+	+
20	+	+	+	+	+	WOMAN	SIN	WINNING	WOMEN	WOMEN
21	SIN	SIN	SIN	SIN	+	WILSON	WILSON	WILSON	WILSON	WILSON
22	+	+	+	+	+	FIM	FIM	+	+	+
23	N/R	+	+	+	+	+	+	+	SIN	SIN
24	+	+	+	+	+	+	+	+	+	+
25	+	+	+	+	+	+	+	+	+	+
26	IN	+	+	+	+	N/R	N/R	N/R	N/R	N/R
27	+	+	+	+	+	+	+	+	+	+
28	+	+	+	+	+	+	+	+	+	+
29	+	+	+	+	+	+	+	+	+	+
30	+	+	+	+	+	+	+	+	+	+
31	+	+	+	+	+	N/R	WINNER	WOMAN	WOMAN	WOMAN
32	+	+	+	+	+	ONLY	BIN	WINDIN	N/R	N/R
NUMBER CORRECT:	22	27	27	28	30	17	17	19	19	17

# Appendix G

Subject Responses for the Speech Synthesized Word "Thin" in the High Probability Sentence Condition.

SUBJECT	VOTRAX PRESENTATION NUMBER					ECHO PRESENTATION NUMBER				
	1	2	3	4	5	1	2	3	4	5
1	IN	+	+	+	+	+	+	+	+	+
2	IN	IN	+	+	+	+	+	+	FIN	+
3	IN	ISN'T	ISN'T	ISN'T	ISN'T	IN	IN	+	N/R	+
4	N/R	+	+	+	+	+	+	+	+	+
5	IN	IN	IN	IN	+	IN	+	+	+	+
6	IN	+	+	+	+	+	+	+	+	+
7	IN	IN	IN	IN	ISN'T	N/R	+	+	+	IT
8	IS	+	+	+	+	+	+	+	+	+
9	IN	+	+	+	+	+	FIN	FIN	+	+
10	N/R	IN	+	+	+	+	+	+	FIN	+
11	N/R	THING	ISN'T	ISN'T	ISN'T	N/R	N/R	THING	THING	ISN'T
12	IN	IN	IN	+	+	N/R	+	+	+	+
13	IN	IN	IN	IN	IN	N/R	N/R	FIT	N/R	N/R
14	IN	IN	IN	IN	IN	N/R	N/R	N/R	N/R	N/R
15	IN	IN	SIN	+	+	+	+	HIM	+	+
16	IN	IN	IN	IN	IN	+	THIM	FIN	FIM	FIM
17	+	+	+	+	+	+	+	+	+	+
18	IS	ISN'T	+	+	+	+	+	+	+	+
19	IN	IN	IN	IN	IN	+	+	+	+	+
20	+	+	+	+	+	+	+	+	+	+
21	+	+	+	+	+	FIM	FIM	FIM	FIM	FIM
22	IN	IN	IN	IN	IN	FIM	+	+	FIM	FIM
23	IN	IN	IN	IN	IN	+	+	+	+	+
24	IN	IN	+	IN	IN	FIM	FIN	FIN	FIM	FIM
25	IN	IN	IN	IN	IN	+	+	+	+	+
26	IN	+	+	+	+	+	+	+	+	+
27	IN	IN	IN	IN	IN	FIN	FIN	FIN	FIM	FIN
28	IN	+	+	+	+	N/R	+	+	+	+
29	IN	IN	IN	IN	IN	N/R	WARMEST	N/R	HUSBAND	IN
30	IN	+	+	+	+	IN	+	+	+	+
31	HIM	IT	IT	HIM	IN	N/R	N/R	N/R	N/R	HIM
32	IN	IN	IN	IN	IN	IN	IN	IN	IN	IN
NUMBER CORRECT:	3	11	15	16	17	16	20	20	18	20

# Appendix G

Subject Responses for the Speech Synthesized Word "Wrath" in the High Probability Sentence Condition.

SUBJECT	VOTRAX PRESENTATION NUMBER					ECHO PRESENTATION NUMBER				
	1	2	3	4	5	1	2	3	4	5
1	REPS	RESS	+	+	+	RAFTS	REST	RASPED	REST	REST
2	+	+	+	+	+	+	+	+	+	+
3	+	+	+	+	+	+	+	+	+	+
4	+	+	+	+	+	+	+	+	+	+
5	RED	+	+	+	+	RATS	+	+	+	+
6	+	+	+	+	+	+	+	+	+	+
7	REST	REST	LEFT	LEFT	REST	LAMP	LEFT	LAUGHED	RAFT	REST
8	+	+	+	+	+	+	+	+	+	+
9	+	+	+	+	+	THAT	+	+	+	+
10	+	+	+	+	+	WRAPS	+	+	+	+
11	N/R	CAB	UNMATCHED	+	+	RACE	RACE	UNMATCHED	AGAIN	+
12	+	+	+	+	+	+	+	+	+	+
13	+	+	+	+	+	+	+	+	+	+
14	+	+	+	+	+	N/R	+	+	+	+
15	+	+	+	+	+	+	+	+	+	+
16	+	+	+	+	+	RAFF	+	+	+	+
17	RAFT	+	+	+	+	RAFT	+	+	+	+
18	RESTED	N/R	RESTED	+	+	RACE	N/R	RAN	N/R	+
19	+	+	+	+	+	REST	REST	WEST	+	+
20	+	+	+	+	+	+	+	+	+	+
21	+	+	+	+	+	RASS	+	+	+	+
22	N/R	+	+	+	+	RAT	+	RA	+	+
23	+	+	+	+	+	+	+	+	+	+
24	N/R	UNT	RETTIS	RESS	+	UNT	RAT	HAT	RACK	RAT
25	N/R	+	+	+	+	N/R	+	+	+	+
26	+	N/R	N/R	+	+	N/R	+	+	+	+
27	RAPS	RAFF	RAFT	RAFT	RAFT	RAFT	RAFT	RAFF	RAFT	RAFF
28	N/R	+	+	+	+	N/R	+	+	+	+
29	+	+	+	+	+	MESS	+	N/R	+	+
30	N/R	RED	+	+	+	MAT	LAST	N/R	LOST	+
31	RED	+	+	+	+	FAST	UNWRAPPED	BACK	+	+
32	N/R	+	+	+	+	BACK	+	+	+	+
NUMBER CORRECT:	18	24	26	29	30	10	23	21	25	28

# Appendix 6

Subject Responses for the Speech Synthesized Word "Bat" in the High Probability Sentence Condition.

SUBJECT	VOTRAX PRESENTATION NUMBER					ECHO PRESENTATION NUMBER				
	1	2	3	4	5	1	2	3	4	5
1	+	+	+	+	+	MAPS	BATS	+	+	+
2	+	+	+	+	+	MAT	BACK	+	+	+
3	+	+	+	+	+	MAN	MIT	+	+	+
4	+	+	+	+	+	N/R	N/R	+	+	+
5	+	+	+	+	+	+	MAT	+	+	+
6	+	+	+	+	+	N/R	N/R	+	+	+
7	+	+	+	+	+	MAN	MAN	MATCH	MATCH	MATCH
8	+	+	+	+	+	CAP	MAT	+	+	+
9	+	+	+	+	+	MAP	MAT	+	+	+
10	+	+	+	+	+	LAMP	MAT	MAT	MAT	MAT
11	+	+	+	+	+	+	+	+	+	+
12	N/R	+	+	+	+	N/R	MAT	MAT	+	+
13	+	+	+	+	+	MASK	MAPS	+	+	+
14	+	+	+	+	+	+	+	+	+	+
15	+	+	+	+	+	LAMP	LAMP	+	+	+
16	+	+	+	+	+	MAT	MAT	+	+	+
17	+	+	+	+	+	+	+	+	+	+
18	+	+	+	+	+	+	+	+	+	+
19	+	+	+	+	+	MAT	+	+	+	+
20	+	+	+	+	+	MATCH	MATCH	+	+	+
21	+	+	+	+	+	+	MAP	+	+	+
22	+	+	+	+	+	MATCH	MATCH	+	+	MATCH
23	+	+	+	+	+	MIT	N/R	+	+	+
24	+	+	+	+	+	MATCH	MATCH	MATCH	MATCH	MATCH
25	+	+	+	+	+	MASS	MASS	MAP	+	+
26	+	+	+	+	+	MAT	MAT	+	+	+
27	+	+	+	+	+	+	+	+	+	+
28	+	+	+	+	+	+	+	+	+	+
29	+	+	+	+	+	MAT	MAT	MAT	+	+
30	+	+	+	+	+	MASK	MASK	+	+	+
31	+	+	+	+	+	LAMP	LAMP	THAT	+	+
32	+	+	+	+	+	MAT	MATE	MAT	MAT	+
NUMBER										
CORRECT:	31	32	32	32	32	8	7	24	28	28

# Appendix B

Subject Responses for the Speech Synthesized Word "Wife" in the High Probability Sentence Condition.

SUBJECT	VOTRAX PRESENTATION NUMBER					ECHO PRESENTATION NUMBER				
	1	2	3	4	5	1	2	3	4	5
1	+	+	+	+	+	+	+	+	+	+
2	+	+	+	+	+	+	+	+	+	+
3	+	+	+	+	+	+	+	+	+	+
4	N/R	+	+	+	+	+	+	+	+	+
5	+	+	+	+	+	+	+	+	+	+
6	+	+	+	+	+	+	+	+	+	+
7	+	+	+	+	+	+	+	+	+	+
8	+	+	+	+	+	+	+	+	+	+
9	+	+	+	+	+	N/R	+	+	+	+
10	+	+	+	+	+	+	+	+	+	+
11	+	+	+	+	+	+	+	+	+	+
12	+	+	N/R	+	+	+	+	+	+	+
13	+	+	+	+	+	+	+	+	+	+
14	+	+	+	+	+	+	+	+	+	+
15	+	+	+	+	+	+	+	+	+	+
16	WIFE	WIFE	WIFE	WIFE	+	+	+	+	+	+
17	+	+	+	+	+	+	+	+	+	+
18	+	+	+	+	+	+	+	+	+	+
19	LIFE	LIFE	LIFE	+	+	LIFE	+	+	+	+
20	+	+	+	+	+	+	+	+	+	+
21	+	+	+	+	+	+	+	+	+	+
22	+	+	+	+	+	+	+	+	+	+
23	+	+	+	+	+	+	+	+	+	+
24	+	+	+	+	+	WI	+	+	+	+
25	+	+	+	+	+	+	+	+	+	+
26	+	+	+	+	+	+	+	+	+	+
27	+	+	+	+	+	LIFE	+	+	+	+
28	+	+	+	+	+	+	+	+	+	+
29	+	+	+	+	+	+	+	+	+	+
30	+	+	+	+	+	+	+	+	+	+
31	+	+	+	+	+	N/R	+	+	+	+
32	+	+	+	+	+	+	+	+	+	+
NUMBER CORRECT:	29	30	29	31	32	27	32	32	32	32

# Appendix B

Subject Responses for the Speech Synthesized Word "Night" in the High Probability Sentence Condition.

SUBJECT	VOTRAX PRESENTATION NUMBER					ECHO PRESENTATION NUMBER				
	1	2	3	4	5	1	2	3	4	5
1	+	+	+	+	+	+	+	+	+	+
2	+	+	+	+	+	+	+	+	+	+
3	+	+	+	+	+	+	+	+	+	+
4	+	+	+	+	+	+	+	+	+	+
5	+	+	+	+	+	+	+	+	+	+
6	+	+	+	+	+	+	+	+	+	+
7	+	+	+	+	+	+	+	+	+	+
8	+	+	+	+	+	+	+	+	+	+
9	+	+	+	+	+	+	+	+	+	+
10	+	+	+	+	+	+	+	+	+	+
11	+	+	+	+	+	+	+	+	+	+
12	+	+	+	+	+	+	+	+	+	N/R
13	+	+	+	+	+	+	+	+	+	+
14	+	+	+	+	+	+	+	+	+	+
15	LIGHT	LIGHT	+	LIGHT	+	+	+	+	+	+
16	+	LIGHT	LIGHT	LIGHT	LIGHT	+	+	+	+	+
17	+	+	+	+	+	+	+	+	+	+
18	+	+	+	+	+	+	+	+	+	+
19	+	+	+	+	+	+	+	+	+	+
20	+	+	+	+	+	+	+	+	+	+
21	+	+	+	+	+	+	+	+	+	+
22	+	+	+	+	+	+	+	+	+	+
23	LIGHT	+	LIGHT	LIGHT	LIGHT	+	LIGHT	LIGHT	LIGHT	LIGHT
24	+	+	+	+	+	+	+	+	+	NITCH
25	+	+	+	+	+	+	+	+	+	+
26	+	+	+	+	+	MEAT	MATE	MATE	MATE	N/R
27	+	+	+	+	+	+	+	+	+	+
28	+	+	+	+	+	+	+	+	+	+
29	+	+	+	+	+	+	+	+	+	+
30	+	+	+	+	+	+	+	+	+	+
31	+	+	+	+	+	+	+	+	+	+
32	+	+	+	LIGHT	+	+	+	+	+	+
NUMBER CORRECT:	30	30	30	28	30	31	30	30	30	28



# Appendix B

Subject Responses for the Speech Synthesized word "Lab" in the High Probability Sentence Condition.

SUBJECT	VOTRAX PRESENTATION NUMBER					EDMO PRESENTATION NUMBER				
	1	2	3	4	5	1	2	3	4	5
1	+	+	+	+	+	BUSINESS	+	+	+	+
2	+	+	+	+	+	LAT	+	+	+	+
3	+	+	+	+	+	+	+	+	+	+
4	+	+	+	+	+	+	+	+	+	+
5	+	+	+	+	+	+	+	+	+	+
6	+	+	+	+	+	N/R	+	+	+	+
7	+	+	+	+	+	THAT	+	+	+	+
8	+	+	+	+	+	+	+	+	+	+
9	+	+	+	+	+	N/R	+	+	+	+
10	+	+	+	+	+	N/R	+	+	+	+
11	+	+	+	+	+	BAT	+	+	+	+
12	+	+	+	+	+	N/R	+	+	+	+
13	+	+	+	+	+	N/R	N/R	N/R	N/R	+
14	+	+	+	+	+	+	+	+	+	+
15	+	+	+	+	+	+	+	+	+	+
16	+	+	+	+	+	+	+	+	+	+
17	+	+	+	+	+	+	+	+	+	+
18	+	+	+	+	+	LAND	+	+	+	+
19	+	+	+	+	+	THAT	+	+	+	+
20	+	+	+	+	+	MATCH	+	+	+	+
21	+	+	+	+	+	N/R	+	+	+	+
22	+	+	+	+	+	N/R	+	+	+	+
23	+	+	+	+	+	N/R	+	+	+	+
24	+	+	+	+	+	N/R	+	+	+	+
25	+	+	+	+	+	+	+	+	+	+
26	N/R	+	+	+	+	N/R	N/R	N/R	N/R	+
27	+	+	+	+	+	+	+	+	+	+
28	+	+	+	+	+	+	+	+	+	+
29	+	+	+	+	+	+	+	+	+	+
30	+	+	+	+	+	MINE	+	+	+	+
31	+	+	+	+	+	BACK	BUSINESS	BUSINESS	BUSINESS	+
32	+	+	+	+	+	N/R	N/R	N/R	+	+
NUMBER										
CORRECT:										
	31	32	32	32	32	12	28	28	29	32

# Appendix G

Subject Responses for the Speech Synthesized Word "Cat" in the High Probability Sentence Condition.

SUBJECT	VOTRAX PRESENTATION NUMBER					ECHO PRESENTATION NUMBER				
	1	2	3	4	5	1	2	3	4	5
1	+	+	+	+	+	ABST	+	+	+	+
2	AT	AT	+	+	+	N/R	+	+	+	+
3	+	+	+	+	+	+	+	+	+	+
4	+	+	+	+	+	+	+	+	+	+
5	+	+	+	+	+	THAT	+	+	+	+
6	+	+	+	+	+	N/R	+	+	+	+
7	+	+	+	+	+	+	+	+	+	+
8	+	+	+	+	+	+	+	+	+	+
9	+	+	+	+	+	NOT	+	+	+	+
10	+	+	+	+	+	+	+	+	+	+
11	+	+	+	+	+	N/R	+	+	+	+
12	+	+	+	+	+	N/R	+	+	+	+
13	+	+	+	+	+	HAT	HAT	+	+	+
14	+	+	+	+	+	N/R	+	+	+	+
15	+	+	+	+	+	+	+	+	+	+
16	+	+	+	+	+	YET	AT	AT	+	AT
17	+	+	+	+	+	MATH	+	+	+	+
18	+	+	+	+	+	+	+	+	+	+
19	+	+	+	+	+	+	+	+	+	+
20	+	+	+	+	+	+	+	N/R	+	+
21	+	+	+	+	+	N/R	+	CABS	NAPS	+
22	+	+	+	+	+	N/R	MATCH	MATCH	MATCH	MATCH
23	+	+	+	+	+	+	+	+	+	+
24	HAT	+	+	HAT	+	MATCH	MATCH	CATCH	CATCH	CATCH
25	BAT	N/R	+	+	+	N/R	N/R	N/R	N/R	N/R
26	BAT	BAT	+	+	+	N/R	N/R	+	+	+
27	+	+	+	+	+	+	+	+	+	+
28	+	+	+	+	+	+	+	+	+	+
29	+	+	+	+	+	N/R	YET	YET	YET	YET
30	+	+	+	+	+	HAT	+	+	+	+
31	GET	+	+	+	+	N/R	+	+	+	+
32	+	+	+	+	+	N/R	+	+	+	+
NUMBER CORRECT:	27	29	32	31	32	12	25	25	27	27

## Appendix H

Total Number of Correct Responses per Target Word Across Five Presentations of Each of the 27 Single Words.

WORD	VOTRAX					ECHO				
	PRESENTATION NUMBER					PRESENTATION NUMBER				
	1	2	3	4	5	1	2	3	4	5
YES	27	26	25	25	24	25	21	22	22	22
FOOT	2	4	4	3	3	11	9	9	10	12
WATCH	3	2	1	4	2	2	1	3	6	6
FALL	10	8	8	8	7	0	1	1	0	2
JUNE	32	32	31	32	31	24	32	30	29	32
THING	0	0	0	0	0	0	0	0	0	0
BATH	0	0	1	0	0	0	0	0	0	0
KNIFE	0	0	0	0	0	11	10	13	11	13
CAB	0	1	0	0	0	0	0	0	0	0
LESS	8	9	8	7	6	6	10	10	14	10
YET	22	23	22	24	24	6	8	6	13	13
SHIRT	31	29	28	28	29	7	7	8	5	6
HEARD	5	3	4	4	2	1	0	1	1	1
NOTCH	1	0	0	1	1	1	4	3	3	3
WALK	0	1	1	1	1	10	3	9	11	12
WALL	5	5	5	6	5	4	8	9	8	8
FOG	0	0	0	0	0	0	0	0	0	0
MOON	22	22	23	18	18	7	6	3	4	2
JEWS	10	10	12	11	9	0	4	8	9	4
SING	0	0	1	1	1	0	0	0	1	0
THIN	0	1	1	0	1	8	10	12	8	12
WRATH	0	0	0	0	0	0	2	0	0	1
BAT	7	6	10	5	5	0	0	0	0	0
WIFE	2	4	1	1	1	21	22	24	20	21
NIGHT	0	0	0	1	2	1	2	1	3	3
LAB	2	1	5	4	5	0	0	0	0	0
CAT	3	5	2	5	3	1	1	1	1	0
TOTALS:	192	192	193	189	180	146	161	173	179	183
MAXIMUM:	32	32	31	32	31	25	32	30	29	32
MINIMUM:	0	0	0	0	0	0	0	0	0	0
MEAN:	7.11	7.11	7.15	7.00	6.67	5.41	5.96	6.41	6.63	6.78
STANDARD DEVIATION:	10.02	9.75	9.56	9.41	9.34	7.33	7.78	7.94	7.58	8.07

# Appendix H

Total Number of Correct Responses per Target Word Across Five Presentations of each of the 27 Low Probability Sentences.

WORD	VOTRAX					ECHO				
	PRESENTATION NUMBER					PRESENTATION NUMBER				
	1	2	3	4	5	1	2	3	4	5
YES	26	26	29	30	29	27	27	28	28	28
HURT	6	6	4	6	5	7	11	9	9	11
WATCH	12	20	20	22	22	17	12	18	19	17
FALL	20	23	21	22	22	4	3	3	4	3
JUNE	32	32	32	32	32	32	32	32	32	32
THING	0	0	0	0	0	0	0	0	0	0
BATH	0	0	0	0	0	0	0	0	0	0
KNIFE	1	1	2	1	2	8	7	7	6	6
CAR	0	0	0	0	0	0	0	0	0	0
LESS	17	22	22	21	20	14	18	18	18	18
YET	28	28	29	28	28	17	17	16	17	20
SHIRT	32	32	32	32	32	2	4	6	5	8
HEARD	6	5	5	5	6	1	0	0	0	0
NOTCH	4	5	3	3	4	1	1	2	2	2
WALK	6	7	6	7	9	8	12	10	10	12
WALL	21	26	27	26	27	7	8	9	8	10
FOG	5	5	5	4	6	0	0	0	0	0
MOON	30	28	31	30	31	4	2	2	1	1
JEWS	9	10	11	10	10	5	6	9	9	7
SING	0	0	0	1	1	0	0	0	1	0
THIN	5	6	8	6	9	8	12	16	15	14
WRATH	0	0	0	0	0	1	1	0	1	2
BAT	6	6	4	6	2	0	0	0	0	0
WIFE	5	5	6	7	8	23	22	23	21	24
NIGHT	2	2	1	2	2	4	2	3	1	3
LAB	6	6	8	7	8	1	0	2	2	1
CAT	5	3	2	2	3	0	1	0	0	0
TOTALS:	286	306	308	310	318	191	198	213	209	219
MAXIMUM:	32	32	32	32	32	32	32	32	32	32
MINIMUM:	0	0	0	0	0	0	0	0	0	0
MEAN:	10.59	11.33	11.41	11.48	11.78	7.07	7.33	7.89	7.74	8.11
STANDARD DEVIATION:	10.79	11.27	11.63	11.50	11.40	8.77	8.89	9.18	9.12	9.35

## Appendix H

Total Number of Correct Responses per Target Word Across Five Presentations of each of the 27 High Probability Sentences.

WORD	VOTRAX					ECHO				
	PRESENTATION NUMBER					PRESENTATION NUMBER				
	1	2	3	4	5	1	2	3	4	5
YES	18	24	26	27	26	25	23	25	22	23
HURT	30	31	31	32	32	30	30	30	29	31
WATCH	29	29	31	31	31	32	31	32	32	32
FALL	28	31	32	32	32	20	28	30	30	30
JUNE	32	32	32	32	31	32	32	32	32	32
THING	32	32	32	32	32	24	30	31	31	31
BATH	26	22	29	29	32	1	26	28	27	29
KNIFE	18	29	29	27	28	12	26	29	28	31
CAB	22	28	30	32	31	27	28	29	30	31
LESS	32	32	32	32	32	21	30	32	31	32
YET	32	32	32	32	31	16	29	29	27	29
SHIRT	32	32	32	32	32	31	30	32	30	32
HEARD	32	32	32	31	32	5	18	28	27	29
NOTCH	7	13	19	20	24	20	20	21	22	21
WALK	32	32	32	32	31	32	32	32	32	32
WALL	32	32	32	32	31	21	21	21	23	23
FOG	24	29	29	29	29	21	22	28	29	29
MOON	32	32	32	32	32	9	10	18	25	20
JEWS	11	9	11	11	9	4	6	5	8	9
SING	22	27	27	28	30	17	17	19	19	17
THIN	3	11	15	16	17	16	20	20	18	20
WRATH	18	24	26	29	30	10	23	21	25	28
BAT	31	32	32	32	32	6	7	24	28	28
WIFE	29	30	29	31	32	27	32	32	32	32
NIGHT	30	30	30	28	30	31	30	30	30	28
LAB	31	32	32	32	32	12	28	28	29	32
CAT	27	29	32	31	32	12	25	25	27	27
TOTALS:	692	748	778	784	793	516	654	711	723	738
MAXIMUM:	32	32	32	32	32	32	32	32	32	32
MINIMUM:	3	9	11	11	9	1	6	5	8	9
MEAN:	25.63	27.70	28.61	29.04	29.37	19.11	24.22	26.33	26.78	27.33
STANDARD DEVIATION:	8.09	6.52	5.33	5.15	5.13	9.30	7.31	6.09	5.31	5.62

# Appendix I

Number and Type of Errors Emitted for the Speech  
Synthesized Word "Yes" in the Echo and Votrax Single  
Word Conditions.

RESPONSE -----	INITIAL /y/ -----		FINAL /s/ -----	
	VOTRAX	ECHO	VOTRAX	ECHO
m	0	1	0	0
n	12	29	0	0
ng	0	0	0	0
b	1	0	0	0
d	0	0	0	0
g	0	0	0	0
p	0	0	0	0
t	0	0	0	2
k	0	0	0	1
dz	0	0	0	1
ch	0	0	0	1
v	0	0	0	0
th+	0	0	0	0
z	0	0	1	1
f	0	0	0	1
th-	0	0	0	0
s	0	0	146	135
sh	0	0	0	0
w	0	0	0	0
l	5	0	0	0
r	0	0	0	0
y	127	121	0	0
h	0	0	0	0
ny	6	9	0	0
gl	9	0	0	0
st	0	0	13	14
TWO				
SYLLABLE WORD	0	0	0	0
DELETED	0	0	0	4
NO RESPONSE	0	0	0	0

# Appendix I

Number and Type of Errors Emitted for the Speech  
Synthesized Word "Hurt" in the Echo and Votrax Single  
Word Condition.

RESPONSE -----	INITIAL /h/ -----		FINAL /t/ -----	
	VOTRAX	ECHO	VOTRAX	ECHO
m	0	0	0	0
n	0	0	0	2
ng	0	0	0	0
b	1	9	0	0
d	0	0	1	2
g	3	0	0	0
p	0	10	0	6
t	0	1	101	58
k	8	0	2	0
dz	0	0	0	0
ch	0	0	0	5
v	0	2	0	0
th+	0	0	0	0
z	0	0	0	0
f	0	42	1	1
th-	0	0	6	6
s	0	0	0	4
sh	70	0	0	0
w	0	0	0	0
l	0	0	0	0
r	0	0	0	0
y	1	0	0	0
h	16	74	0	0
sk	1	0	0	0
st	0	0	1	26
ps	0	0	0	1
ts	0	0	0	4
TWO SYLLABLE WORD	46	0	46	0
DELETED	12	17	0	40
NO RESPONSE	2	5	2	5

# Appendix I

Number and Type of Errors Emitted for the Speech  
Synthesized Word "Watch" in the Echo and Votrax Single  
Word Conditions.

RESPONSE	INITIAL /w/ -----		FINAL /ch/ -----	
	VOTRAX	ECHO	VOTRAX	ECHO
m	1	94	0	3
n	0	9	0	3
ng	0	0	0	2
b	0	0	0	0
d	0	0	0	0
g	0	0	0	0
p	0	0	0	5
t	0	0	24	9
k	0	0	9	8
dz	0	0	5	0
ch	0	0	110	98
v	0	0	0	1
th+	0	0	0	0
z	0	0	0	0
f	0	0	0	0
th-	0	0	0	3
s	0	0	0	0
sh	0	0	0	0
w	15	25	0	0
l	20	22	3	0
r	0	0	0	0
y	0	0	0	0
h	0	0	0	0
bl	122	0	0	0
pl	1	0	0	0
lch	0	0	0	2
ns	0	0	0	1
lt	0	0	0	3
kt	0	0	6	0
ts	0	0	1	0
nch	0	0	0	6
TWO				
SYLLABLE WORD	0	0	0	0
DELETED	1	1	2	7
NO RESPONSE	0	9	0	9



# Appendix I

Number and Type of Errors Emitted for the Speech  
Synthesized Word "Fall" in the Echo and Votrax Single  
Word Conditions.

RESPONSE	INITIAL /f/ -----		FINAL /l/ -----	
	VOTRAX	ECHO	VOTRAX	ECHO
m	0	2	0	61
n	0	0	0	62
ng	0	0	0	0
b	12	8	0	0
d	0	0	0	0
g	0	1	0	4
p	0	2	0	0
t	1	0	0	0
k	0	5	0	0
dz	0	0	0	0
ch	0	0	0	0
v	0	0	0	1
th+	0	0	0	0
z	0	0	0	0
f	41	42	0	0
th-	1	7	0	0
s	65	0	0	0
sh	2	0	0	0
w	0	2	0	0
l	2	0	131	21
r	0	0	0	0
y	0	0	0	0
h	0	14	0	0
bl	0	1	0	0
mp	0	0	0	2
sl	2	0	0	0
shl	1	0	0	0
sm	2	0	0	0
st	5	0	0	0
lt	0	0	3	0
ld	0	0	0	1
lm	0	0	0	1
TWO				
SYLLABLE WORD	11	0	11	0
DELETED	10	69	10	0
NO RESPONSE	5	7	5	7

# Appendix I

Number and Type of Errors Emitted for the Speech  
Synthesized Word "June" in the Echo and Votrax Single  
Word Conditions.

RESPONSE -----	INITIAL /dz/ -----		FINAL /n/ -----	
	VOTRAX	ECHO	VOTRAX	ECHO
m	0	0	2	2
n	0	0	158	148
ng	0	0	0	0
b	0	0	0	0
d	0	0	0	0
g	0	0	0	0
p	0	0	0	0
t	0	5	0	1
k	0	0	0	0
dz	160	154	0	0
ch	0	0	0	0
v	0	0	0	0
th+	0	0	0	0
z	0	0	0	1
f	0	0	0	0
th-	0	0	0	0
s	0	1	0	0
sh	0	0	0	0
w	0	0	0	0
l	0	0	0	0
r	0	0	0	0
y	0	0	0	0
h	0	0	0	0
TWO				
SYLLABLE WORD	0	0	0	0
DELETED	0	0	0	8
NO RESPONSE	0	0	0	0

# Appendix I

Number and Type of Errors Emitted for the Speech  
Synthesized Word "Thing" in the Echo and Votrax Single  
Word Conditions.

RESPONSE -----	INITIAL /th-/ -----		FINAL /ng/ -----	
	VOTRAX	ECHO	VOTRAX	ECHO
m	0	0	0	63
n	0	0	119	87
ng	0	0	7	1
b	0	13	0	0
d	0	1	0	0
g	0	0	0	0
p	0	0	0	0
t	9	1	0	0
k	0	0	0	0
dz	0	0	0	0
ch	0	0	0	0
v	1	0	0	0
th+	0	0	0	0
z	16	0	0	0
f	0	9	0	0
th-	6	51	0	0
s	123	29	0	0
sh	0	0	0	0
w	0	0	0	0
l	0	0	31	0
r	0	1	0	0
y	0	1	0	0
h	0	15	0	0
sw	0	8	0	0
TWO SYLLABLE WORD	1	4	1	4
DELETED	3	22	1	0
NO RESPONSE	1	5	1	5

# Appendix I

Number and Type of Errors Emitted for the Speech  
Synthesized Word "Bath" in the Echo and Votrax Single  
Word Conditions.

RESPONSE	INITIAL /b/ -----		FINAL /th-/ -----	
	VOTRAX	ECHO	VOTRAX	ECHO
m	0	146	0	0
n	0	0	0	3
ng	0	0	0	0
b	41	0	0	0
d	1	0	0	0
g	0	0	0	0
p	1	0	0	0
t	0	0	18	13
k	0	0	0	0
dz	0	0	0	0
ch	0	0	0	2
v	1	0	0	0
th+	9	1	0	0
z	0	0	0	0
f	1	0	1	4
th-	0	0	1	29
s	0	0	103	83
sh	0	0	0	0
w	1	0	0	0
l	31	9	0	0
r	6	0	0	0
y	0	0	0	0
h	0	0	0	0
gl	27	2	0	0
bl	24	0	0	0
st	0	0	27	1
ts	0	0	2	0
sk	0	0	0	18
ps	0	0	0	1
kl	1	0	0	0
dr	5	0	0	0
spl	1	0	0	0
TWO				
SYLLABLE WORD	2	0	2	0
DELETED	2	1	0	5
NO RESPONSE	6	1	6	1

# Appendix I

Number and Type of Errors Emitted for the Speech  
Synthesized Word "Knife" in the Echo and Votrax Single  
Word Conditions.

RESPONSE	INITIAL /n/		FINAL /f/	
	VOTRAX	ECHO	VOTRAX	ECHO
m	0	55	0	0
n	3	58	0	0
ng	0	0	0	0
b	0	0	0	0
d	0	0	0	0
g	0	0	0	0
p	0	0	0	0
t	0	0	2	3
k	0	0	4	2
dz	0	0	0	0
ch	0	0	0	0
v	0	0	0	0
th+	0	0	0	0
z	0	0	10	0
f	0	0	90	119
th-	0	0	4	2
s	0	0	47	18
sh	0	0	0	0
w	15	14	0	0
l	124	32	0	1
r	1	0	0	0
y	0	0	0	0
h	0	0	0	0
bl	15	0	0	0
lt	0	0	0	1
lf	0	0	0	3
nth	0	0	0	5
ts	0	0	1	0
spl	1	0	0	0
sp	0	0	2	0
TWO				
SYLLABLE WORD	0	0	0	0
DELETED	1	0	0	5
NO RESPONSE	0	1	0	1

# Appendix I

Number and Type of Errors Emitted for the Speech  
Synthesized Word "Cab" in the Echo and Votrax Single  
Word Conditions.

RESPONSE -----	INITIAL /k/ -----		FINAL /b/ -----	
	VOTRAX	ECHO	VOTRAX	ECHO
m	0	7	1	1
n	0	0	1	4
ng	0	0	0	0
b	5	0	61	0
d	13	0	15	1
g	19	2	0	0
p	0	10	1	7
t	16	0	18	92
k	2	18	0	1
dz	0	0	0	0
ch	0	0	0	0
v	0	0	0	0
th+	2	0	0	0
z	0	0	0	0
f	0	6	1	1
th-	0	0	0	1
s	0	0	0	1
sh	0	0	0	0
w	0	0	0	0
l	2	0	18	0
r	0	0	0	1
y	0	0	0	0
h	3	12	0	0
gl	1	0	0	0
pt	0	0	1	0
lb	0	0	1	0
nts	0	0	0	1
kt	0	0	0	2
TWO				
SYLLABLE WORD	28	0	28	0
DELETED	58	85	3	27
NO RESPONSE	11	20	11	20

# Appendix I

Number and Type of Errors Emitted for the Speech  
Synthesized Word "Less" in the Echo and Votrax Single  
Word Conditions.

RESPONSE	INITIAL /l/ -----		FINAL /s/ -----	
	VOTRAX	ECHO	VOTRAX	ECHO
m	0	68	0	0
n	0	13	0	0
ng	0	0	0	0
b	0	0	0	0
d	0	0	0	0
g	0	0	0	0
p	0	0	0	0
t	0	0	0	7
k	0	0	0	0
dz	0	0	0	0
ch	0	0	0	1
v	0	0	0	0
th+	0	0	0	0
z	0	0	0	3
f	0	5	0	1
th-	0	0	1	6
s	0	0	151	112
sh	0	0	0	0
w	1	1	0	0
l	44	61	0	0
r	2	4	0	0
y	0	0	0	0
h	0	1	0	0
bl	46	2	0	0
gl	60	0	0	0
st	0	0	1	16
dr	4	1	0	0
sk	0	0	0	7
cl	2	0	7	0
sp	0	0	0	3
TWO				
SYLLABLE WORD	0	1	0	1
DELETED	1	0	0	0
NO RESPONSE	0	3	0	3

# Appendix I

Number and Type of Errors Emitted for the Speech  
Synthesized Word "Yet" in the Echo and Votrax Single  
Word Conditions.

RESPONSE	INITIAL /y/ -----		FINAL /t/ -----	
	VOTRAX	ECHO	VOTRAX	ECHO
m	7	4	0	0
n	14	21	0	2
ng	0	0	0	0
b	0	0	0	0
d	1	1	4	0
g	1	1	0	0
p	0	0	0	3
t	0	0	153	75
k	2	0	1	4
dz	0	0	0	0
ch	0	1	0	3
v	0	0	0	0
th+	0	0	0	0
z	0	0	0	6
f	0	0	0	2
th-	0	0	0	1
s	0	0	1	39
sh	0	3	0	0
w	0	0	0	0
l	8	0	0	0
r	0	0	0	0
y	116	106	0	0
h	0	2	0	0
gl	3	0	0	0
ny	7	6	0	0
ps	0	0	0	1
st	0	0	0	1
ts	0	0	0	1
TWO				
SYLLABLE WORD	1	5	1	5
DELETED	0	1	0	8
NO RESPONSE	0	9	0	9



# Appendix I

Number and Type of Errors Emitted for the Speech Synthesized Word "Shirt" in the Echo and Votrax Single Word Conditions.

RESPONSE	INITIAL /sh/		FINAL /t/	
	VOTRAX	ECHO	VOTRAX	ECHO
m	0	0	0	0
n	0	0	0	0
ng	0	0	0	0
b	0	7	0	2
d	0	1	0	2
g	0	0	0	0
p	0	0	0	9
t	0	0	148	75
k	0	0	0	0
dz	0	0	0	0
ch	1	3	0	3
v	0	2	0	0
th+	0	0	0	0
z	0	0	0	0
f	0	28	0	0
th-	0	0	0	12
s	0	0	0	0
sh	146	34	0	0
w	0	0	0	0
l	0	0	0	0
r	0	0	1	0
y	1	0	0	0
h	0	56	0	0
ps	0	0	0	3
pst	0	0	0	3
st	0	0	0	15
ts	0	0	0	4
sl	1	0	0	0
sp	0	1	0	0
TWO				
SYLLABLE WORD	11	0	11	0
DELETED	0	23	0	27
NO RESPONSE	0	5	0	5

# Appendix I

Number and Type of Errors Emitted for the Speech  
Synthesized Word "Heard" in the Echo and Votrax Single  
Word Conditions.

RESPONSE	INITIAL /h/ -----		FINAL /d/ -----	
	VOTRAX	ECHO	VOTRAX	ECHO
errnot				
m	0	0	0	0
n	0	0	4	4
ng	0	0	0	0
b	13	24	0	1
d	3	0	56	25
g	8	1	1	8
p	0	8	1	14
t	4	0	35	11
k	5	0	0	3
dz	3	0	1	0
ch	0	0	0	0
v	0	0	1	0
th+	0	0	0	0
z	0	0	0	0
f	1	20	0	1
th-	9	2	0	3
s	0	0	0	3
sh	35	0	0	0
w	0	0	0	0
l	0	0	5	1
r	0	0	0	0
y	0	0	0	0
h	18	19	0	0
st	0	0	1	4
THREE				
SYLLABLE WORD	16	5	16	5
TWO				
SYLLABLE WORD	27	47	27	47
DELETED	8	18	2	14
NO RESPONSE	10	16	10	16

# Appendix I

Number and Type of Errors Emitted for the Speech  
Synthesized Word "Notch" in the Echo and Votrax Single  
Word Conditions.

RESPONSE	INITIAL /n/		FINAL /ch/	
	VOTRAX	ECHO	VOTRAX	ECHO
m	4	139	0	2
n	11	16	0	1
ng	0	0	0	0
b	1	0	0	0
d	0	0	0	0
g	0	0	0	0
p	0	0	0	6
t	0	0	32	5
k	0	0	3	2
dz	0	0	7	0
ch	0	0	113	120
v	0	0	0	0
th+	0	0	0	0
z	0	0	0	0
f	0	0	0	0
th-	0	0	0	3
s	0	0	0	0
sh	0	0	0	0
w	21	0	0	0
l	40	4	0	0
r	0	0	0	0
y	0	0	0	0
h	0	0	0	0
bl	83	0	0	0
lt	0	0	0	1
lk	0	0	0	1
lch	0	0	0	3
kt	0	0	5	0
nth	0	0	0	1
nch	0	0	0	1
ts	0	0	0	1
TWO				
SYLLABLE WORD	0	0	0	0
DELETED	0	0	0	12
NO RESPONSE	0	1	0	1

# Appendix I

Number and Type of Errors Emitted for the Speech  
Synthesized Word "Wall" in the Echo and Votrax Single  
Word Conditions.

RESPONSE	INITIAL /w/ -----		FINAL /l/ -----	
	VOTRAX	ECHO	VOTRAX	ECHO
m	0	11	0	50
n	0	0	0	48
ng	0	0	0	2
b	43	2	0	1
d	3	0	0	0
g	0	0	0	1
p	0	0	0	0
t	0	0	1	0
k	0	0	0	0
dz	0	0	0	0
ch	0	0	0	0
v	0	0	0	0
th+	0	0	0	0
z	0	0	0	0
f	3	0	0	0
th-	0	0	0	0
s	0	0	1	0
sh	0	0	0	0
w	27	111	5	0
l	30	25	137	55
r	0	2	0	0
y	0	0	0	0
h	0	1	0	0
bl	43	1	0	0
gl	0	4	0	0
TWO				
SYLLABLE WORD	4	2	4	2
DELETED	2	0	7	0
NO RESPONSE	5	1	5	1

# Appendix I

Number and Type of Errors Emitted for the Speech  
Synthesized Word "Walk" in the Echo and Votrax Single  
Word Conditions.

RESPONSE	INITIAL /w/		FINAL /k/	
	VOTRAX	ECHO	VOTRAX	ECHO
m	1	20	1	0
n	0	0	0	1
ng	0	0	0	1
b	0	0	4	0
d	0	0	1	0
g	0	0	0	1
p	0	0	0	0
t	0	0	28	0
k	0	0	104	64
dz	0	0	0	0
ch	0	0	2	0
v	0	0	0	5
th+	0	0	0	0
z	0	0	0	0
f	0	0	0	7
th-	0	0	0	1
s	0	0	0	0
sh	0	0	0	0
w	6	97	0	0
l	28	37	1	23
r	0	0	0	5
y	0	0	0	0
h	0	1	0	0
bl	122	0	0	0
fl	1	0	0	0
lf	0	0	0	24
mth	0	0	0	1
lt	0	0	0	3
ft	0	0	0	5
kt	0	0	2	0
TWO				
SYLLABLE WORD	0	0	0	0
DELETED	2	0	17	14
NO RESPONSE	0	5	0	5

# Appendix I

Number and Type of Errors Emitted for the Speech  
Synthesized Word "Fog" in the Echo and Votrax Single  
Word Conditions.

RESPONSE	INITIAL /f/ -----		FINAL /g/ -----	
	VOTRAX	ECHO	VOTRAX	ECHO
m	0	3	0	14
n	0	0	0	15
ng	0	0	0	0
b	0	1	0	0
d	0	0	40	0
g	0	0	9	3
p	0	0	1	3
t	0	2	2	0
k	0	0	6	0
dz	5	1	0	0
ch	0	0	0	0
v	0	0	0	10
th+	0	0	0	0
z	0	0	0	1
f	0	9	0	0
th-	0	0	0	0
s	75	1	0	0
sh	1	0	0	1
w	0	1	0	0
l	1	0	0	6
r	0	0	0	0
y	0	0	0	0
h	0	2	0	0
sl	27	1	0	0
shl	1	0	0	0
fr	1	0	0	0
nd	0	0	0	2
st	1	0	0	0
fl	4	0	0	0
ft	0	0	1	0
TWO				
SYLLABLE WORD	23	58	23	58
DELETED	13	37	70	3
NO RESPONSE	8	44	8	44

# Appendix I

Number and Type of Errors Emitted for the Speech  
Synthesized Word "Moon" in the Echo and Votrax Single  
Word Conditions.

RESPONSE -----	INITIAL /m/ -----		FINAL /n/ -----	
	VOTRAX	ECHO	VOTRAX	ECHO
m	103	22	27	42
n	1	40	109	103
ng	0	0	0	0
b	2	0	0	0
d	0	0	0	0
g	0	0	0	0
p	0	0	0	0
t	0	0	0	0
k	0	0	0	0
dz	0	0	0	0
ch	0	0	0	0
v	0	0	0	0
th+	0	0	0	0
z	0	0	0	0
f	0	0	0	0
th-	0	0	0	0
s	0	0	0	0
sh	0	0	0	0
w	0	0	0	0
l	4	68	0	0
r	2	10	0	0
y	0	0	0	0
h	0	0	0	0
bl	20	8	0	0
gl	1	0	0	0
TWO				
SYLLABLE WORD	21	12	21	12
DELETED	4	0	1	3
NO RESPONSE	2	0	2	0

# Appendix I

Number and Type of Errors Emitted for the Speech  
Synthesized Word "Jews" in the Echo and Votrax Single  
Word Conditions.

RESPONSE	INITIAL /dz/		FINAL /z/	
	VOTRAX	ECHO	VOTRAX	ECHO
m	0	0	0	0
n	0	0	15	3
ng	0	0	0	0
b	0	0	0	0
d	0	0	0	0
g	0	0	0	0
p	0	0	0	0
t	0	0	0	0
k	0	0	0	0
dz	86	73	0	0
ch	5	7	0	0
v	0	0	0	0
th+	0	0	0	0
z	0	0	62	34
f	0	0	0	0
th-	0	0	0	0
s	0	0	19	43
sh	5	2	0	0
w	0	0	0	0
l	0	0	0	0
r	0	0	0	0
y	0	0	0	0
h	0	0	0	0
nz	0	0	0	1
lsh	0	0	0	1
THREE				
SYLLABLE WORD	0	17	0	17
TWO				
SYLLABLE WORD	64	58	64	58
DELETED	0	0	0	0
NO RESPONSE	0	3	0	3



# Appendix I

Number and Type of Errors Emitted for the Speech  
Synthesized Word "Sing" in the Echo and Votrax Single  
Word Conditions.

RESPONSE	INITIAL /s/ -----		FINAL /ng/ -----	
	VOTRAX	ECHO	VOTRAX	ECHO
m	0	0	0	72
n	1	0	120	83
ng	0	0	4	1
b	0	7	0	0
d	0	0	0	0
g	0	0	0	0
p	0	0	0	0
t	6	0	0	0
k	0	0	0	0
dz	0	0	0	0
ch	0	0	0	0
v	0	0	0	0
th+	0	0	0	0
z	14	8	0	0
f	0	8	0	0
th-	0	11	0	0
s	136	90	0	0
sh	0	0	0	0
w	0	0	0	0
l	0	0	31	0
r	0	2	0	0
y	0	0	0	0
h	0	14	0	0
nd	0	0	2	0
sw	0	7	0	0
mp	0	0	0	1
nd	0	0	0	1
gr	0	1	0	0
TWO				
SYLLABLE WORD	1	2	1	2
DELETED	0	10	0	0
NO RESPONSE	2	0	2	0

# Appendix I

Number and Type of Errors Emitted for the Speech  
Synthesized Word "Thin" in the Echo and Votrax Single  
Word Conditions.

RESPONSE	INITIAL /th-/		FINAL /n/	
	VOTRAX	ECHO	VOTRAX	ECHO
m	1	0	0	68
n	1	0	123	85
ng	0	0	4	0
b	0	11	0	0
d	0	2	0	0
g	0	0	0	0
p	0	0	0	0
t	6	0	0	0
k	0	0	0	0
dz	0	0	0	0
ch	0	0	0	0
v	0	0	1	0
th+	0	0	0	0
z	18	1	0	0
f	1	14	0	0
th-	4	49	0	0
s	128	29	0	0
sh	0	0	0	0
w	0	0	0	0
l	0	0	30	0
r	0	4	0	0
y	0	0	0	0
h	0	17	0	0
sw	0	7	0	0
sp	0	1	0	0
TWO				
SYLLABLE WORD	0	5	0	5
DELETED	1	18	2	0
NO RESPONSE	0	2	0	2

# Appendix I

Number and Type of Errors Emitted for the Speech  
Synthesized Word "Wrath" in the Echo and Votrax Single  
Word Conditions.

RESPONSE	INITIAL /w/ -----		FINAL /th-/ -----	
	VOTRAX	ECHO	VOTRAX	ECHO
m	0	106	0	0
n	0	4	0	1
ng	0	0	0	0
b	0	0	0	0
d	0	0	0	0
g	0	0	0	0
p	0	0	0	0
t	0	0	11	14
k	0	0	0	1
dz	0	0	0	0
ch	0	0	0	3
v	0	0	0	0
th+	0	0	0	0
z	0	0	5	0
f	1	0	0	4
th-	0	0	0	23
s	0	0	95	66
sh	0	0	0	0
w	0	0	0	0
l	4	11	0	0
r	67	36	0	0
y	0	0	0	0
h	0	0	0	0
bl	2	0	0	0
dr	36	0	0	0
pr	1	0	0	0
gl	12	0	0	0
br	16	0	0	0
sp	0	0	4	2
st	0	0	30	18
ts	0	0	2	0
sk	0	0	0	16
gr	8	0	0	0
ft	0	0	0	5
TWO				
SYLLABLE WORD	5	0	5	0
DELETED	1	0	1	4
NO RESPONSE	7	3	7	3

# Appendix I

Number and Type of Errors Emitted for the Speech  
Synthesized Word "Bat" in the Echo and Votrax Single  
Word Conditions.

RESPONSE	INITIAL /b/		FINAL /t/	
	VOTRAX	ECHO	VOTRAX	ECHO
m	1	151	0	0
n	0	0	0	2
ng	0	0	0	0
b	66	0	0	0
d	1	0	11	0
g	1	0	0	0
p	0	0	0	12
t	0	0	140	57
k	0	0	0	2
dz	0	0	0	0
ch	0	0	0	39
v	0	0	0	0
th+	49	0	0	0
z	0	0	0	0
f	1	0	0	0
th-	0	0	0	2
s	0	0	6	4
sh	0	0	0	0
w	3	0	0	0
l	11	7	0	0
r	3	0	0	0
y	2	0	0	0
h	0	0	0	0
bl	13	0	0	0
ts	0	0	2	1
ps	0	0	0	33
dr	5	0	0	0
gl	2	0	0	0
sk	0	0	0	1
TWO				
SYLLABLE WORD	0	0	0	0
DELETED	1	1	0	6
NO RESPONSE	1	1	1	1

# Appendix I

Number and Type of Errors Emitted for the Speech  
Synthesized Word "Wife" in the Echo and Votrax Single  
Word Conditions.

RESPONSE	INITIAL /w/ -----		FINAL /f/ -----	
	VOTRAX	ECHO	VOTRAX	ECHO
m	3	1	0	0
n	0	0	0	0
ng	0	0	0	0
b	0	0	0	0
d	0	0	0	0
g	0	0	0	0
p	0	0	0	0
t	0	0	5	0
k	0	0	5	0
dz	0	0	0	0
ch	0	0	0	0
v	0	1	0	0
th+	0	0	0	0
z	0	0	11	0
f	0	0	84	146
th-	0	0	13	0
s	0	0	36	5
sh	0	0	0	0
w	9	116	0	0
l	99	40	0	1
r	0	0	0	0
y	0	0	0	0
h	0	0	0	0
bl	44	0	0	0
spl	4	0	0	0
lf	0	0	0	2
nds	0	0	3	0
sp	0	0	2	0
nth	0	0	0	1
TWO SYLLABLE WORD	0	2	0	2
DELETED	0	0	0	3
NO RESPONSE	1	0	1	0

# Appendix I

Number and Type of Errors Emitted for the Speech  
Synthesized Word "Night" in the Echo and Votrax Single  
Word Conditions.

RESPONSE -----	INITIAL /n/ -----		FINAL /t/ -----	
	VOTRAX	ECHO	VOTRAX	ECHO
m	1	130	0	0
n	3	12	0	0
ng	0	0	0	0
b	0	0	0	0
d	0	0	11	0
g	0	0	0	0
p	0	0	0	1
t	0	0	148	100
k	0	0	0	7
dz	0	0	0	0
ch	0	0	0	4
v	0	0	0	0
th+	0	0	0	0
z	0	0	0	0
f	0	0	0	1
th-	0	0	0	5
s	0	0	0	12
sh	0	0	0	0
w	11	0	0	0
l	118	13	0	0
r	0	0	0	0
y	0	0	0	0
h	0	0	0	0
bl	26	0	0	0
ts	0	0	0	8
lk	0	0	0	2
lt	0	0	0	9
lch	0	0	0	1
gl	1	0	0	0
nd	0	0	1	0
ps	0	0	0	1
TWO				
SYLLABLE WORD	0	0	0	0
DELETED	0	0	0	4
NO RESPONSE	0	5	0	5

# Appendix I

Number and Type of Errors Emitted for the Speech  
Synthesized Word "Lab" in the Echo and Votrax Single  
Word Conditions.

RESPONSE -----	INITIAL /l/ -----		FINAL /b/ -----	
	VOTRAX	ECHO	VOTRAX	ECHO
m	0	99	1	2
n	0	1	7	15
ng	0	0	0	0
b	0	0	54	0
d	0	0	57	0
g	0	0	2	0
p	0	0	3	27
t	0	0	7	63
k	0	0	0	3
dz	0	0	0	0
ch	0	0	0	0
v	0	0	0	1
th+	1	1	0	0
z	0	0	0	0
f	0	0	0	1
th-	0	0	0	3
s	0	0	0	1
sh	0	0	0	0
w	7	4	0	0
l	43	37	7	0
r	0	0	0	0
y	0	0	0	0
h	0	0	0	0
bl	49	2	0	0
gl	41	0	0	0
nd	0	0	1	0
mp	0	0	5	5
st	0	0	0	1
TWO				
SYLLABLE WORD	7	0	7	0
DELETED	5	1	2	23
NO RESPONSE	7	15	7	15

# Appendix I

Number and Type of Errors Emitted for the Speech  
Synthesized Word "Cat" in the Echo and Votrax Single  
Word Conditions.

RESPONSE -----	INITIAL /k/ -----		FINAL /t/ -----	
	VOTRAX	ECHO	VOTRAX	ECHO
m	0	44	0	0
n	1	1	0	4
ng	0	0	0	0
b	2	1	0	0
d	10	0	8	0
g	21	0	0	0
p	2	17	0	1
t	2	0	150	71
k	18	11	0	0
dz	0	0	0	0
ch	0	0	0	34
v	0	1	0	0
th+	8	0	0	1
z	0	0	0	0
f	4	4	0	0
th-	0	0	0	0
s	0	0	0	0
sh	0	0	0	0
w	0	0	0	0
l	0	0	0	0
r	0	0	0	0
y	0	0	0	0
h	13	13	0	0
ts	0	0	1	2
pts	0	0	0	1
st	0	0	0	2
bst	0	0	0	6
ps	0	0	0	21
pf	0	0	0	2
TWO SYLLABLE WORD	0	3	0	3
DELETED	78	59	0	6
NO RESPONSE	1	6	1	6